

Day Two:

Your child should check their work on the practice worksheets today with the answer key on the next page.

In addition, your child should read the lab activity and start collecting all of the necessary materials!

Answer Key for Practice Problems

Vocabulary Review

- | | |
|----------------------------------|---|
| 1) cranial nerves | 14) cerebrum |
| 2) spinal nerves | 15) gray matter |
| 3) spinal cord | 16) brain |
| 4) thalamus | 17) diencephalon |
| 5) cerebrospinal fluid (CSF) | 18) cerebellum |
| 6) medulla oblongata (brainstem) | 19) lobes |
| 7) skull | 20) white matter |
| 8) pons | 21) meninges |
| 9) cauda equina | 22) arbor vitae |
| 10) frontal lobe | 23) cerebral hemispheres (right and left) |
| 11) parietal lobe | 24) the pyramids |
| 12) temporal lobe | 25) cerebral cortex |
| 13) occipital lobe | |

Multiple Choice

- | | |
|------|------|
| 1) C | 4) E |
| 2) D | 5) D |
| 3) B | 6) C |

Application Questions

Edema occurs in any inflamed tissue. This accumulation of fluid between the brain and the skull can cause damage by pressing against neurons of the brain. If the edema is excessive, brain damage and/or death can occur.

Day Three: Lab Activity

Your child should have already read through this lab and has been reviewing all of this week's vocabulary words.

Collect your supplies for the lab:

Traceable diagram sheets (attached)

Pencil

Small mirror

Book

Safety goggles with a flat face plate

Thick piece of cardboard

Scissors

Timer/Watch with second hand

Tape

Plastic or glass prism approximately

2in (5cm) in length

Crumpled paper and trash can

Retrain Your Brain *or...*

A lifetime of learning has its benefits.

A new behavior will be learned as the brain uses a new way of looking at a problem.

Materials:

Traceable diagram sheets (attached)
Pencil
Small mirror
Book
Safety goggles with a flat face plate
Thick piece of cardboard

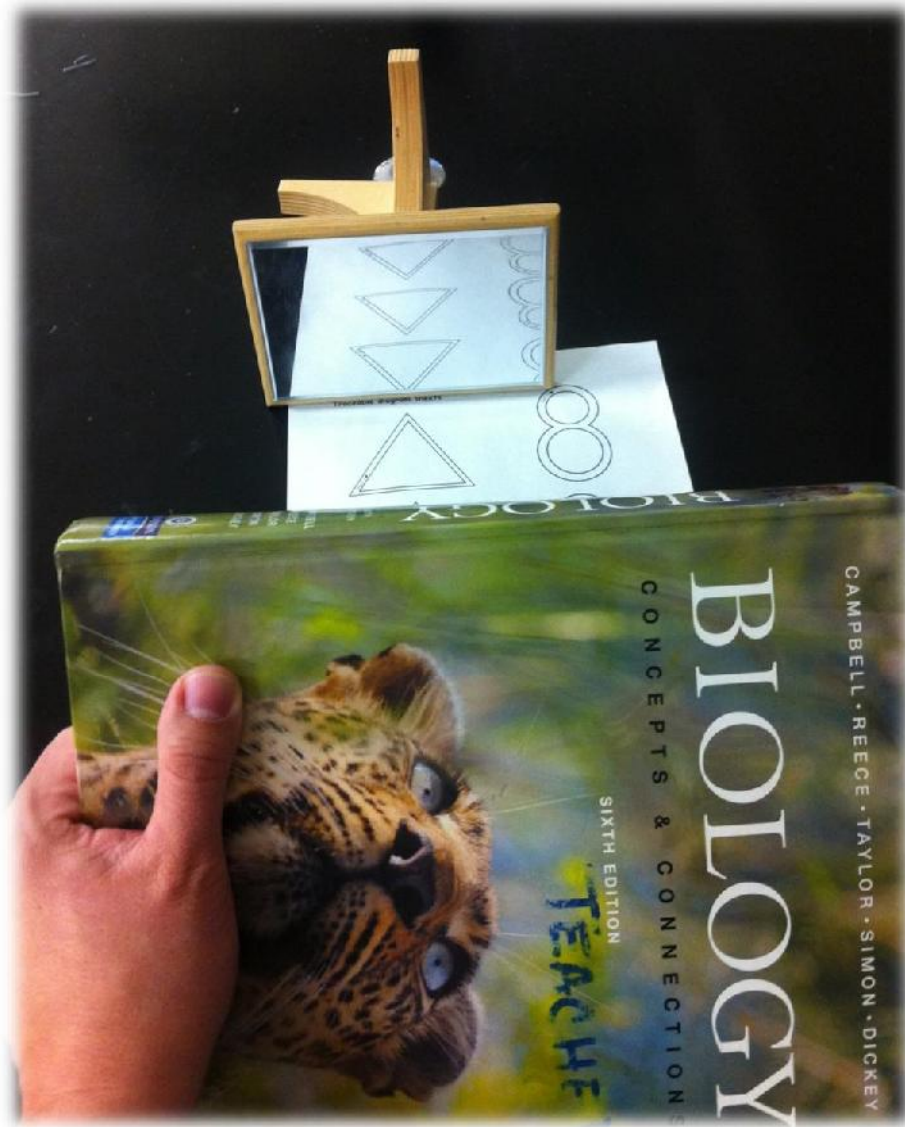
Scissors
Timer/Watch with second hand
Tape
Plastic or glass prism approximately
2in (5cm) in length
Crumpled paper and trash can



Procedure:

Step One:

- 1) Place a mirror perpendicular to the traceable diagram sheet. Sit at a table facing the mirror so that you can see the sheet within the mirror. Use a book to block your vision of the diagrams as you should only see the diagrams within the mirror.

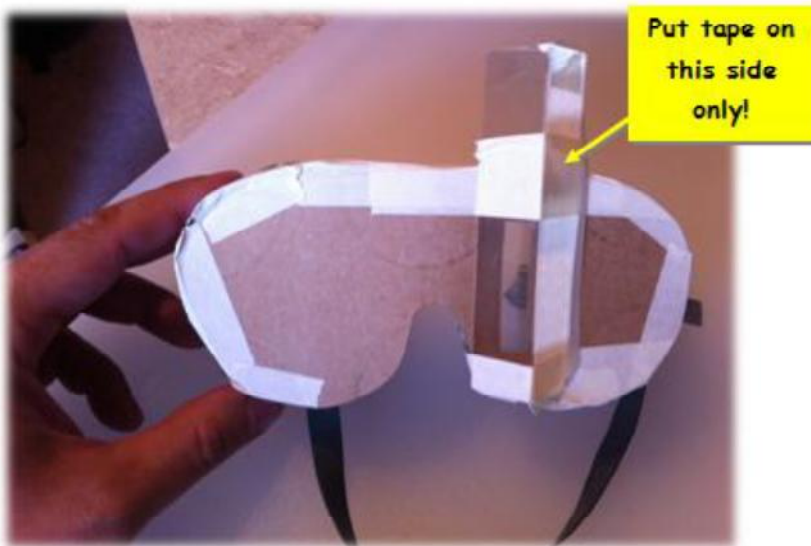


- 2) Put your pencil on the "Start" of each diagram. Time yourself to see how long it takes for you to draw a line through the triangle and figure eight diagrams. Repeat this procedure six times for each drawing, recording each time.

Step Two:

- 3) Trace the face plate of the goggles onto the piece of cardboard. Cut out this image.
- 4) Cut a rectangular opening in the cardboard near the area where one of your eyes will be located. The width of this opening should be about half as wide as one side of the prism.

- 5) Tape the cardboard onto the face plate of the goggles. Place the widest side of the prism onto the hole in the cardboard and tape it to the goggles as well. Cover the side of the prism that, when worn, will be farthest from your nose. This will only allow light to enter one side of the prism.



Time to retrain your brain:

- 6) Stand 9-10 feet from a target and attempt to throw an object (safely) towards it. This may require the help from a friend.
- 7) Do this a few times to become familiar with this activity.
- 8) Put on the goggles and position your body so that you can see the target through the prism. Try to hit the target at this time. Have your friend help retrieve the object.
- 9) Continue to attempt this task until you can hit the target three times in a row.

Explanation:

The reversed image that is seen within the mirror forces your brain to change a pattern of behavior that it has previously learned. This new experience calls upon the frontal, parietal, and occipital lobes of the cerebral cortex to work collectively as you practice this new skill. The time it took you to draw each of these diagrams should have decreased as your amount of practice increased.

Both the drawing activity and the goggles experiment forced your brain to adjust its visual perception to change its response to the perceived stimulus.

Diagram sheets

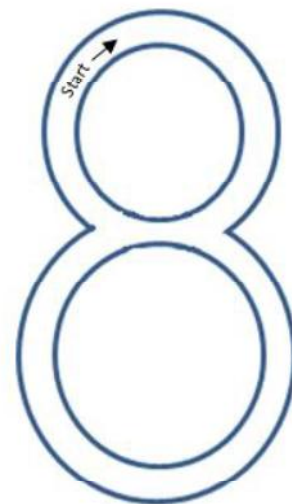
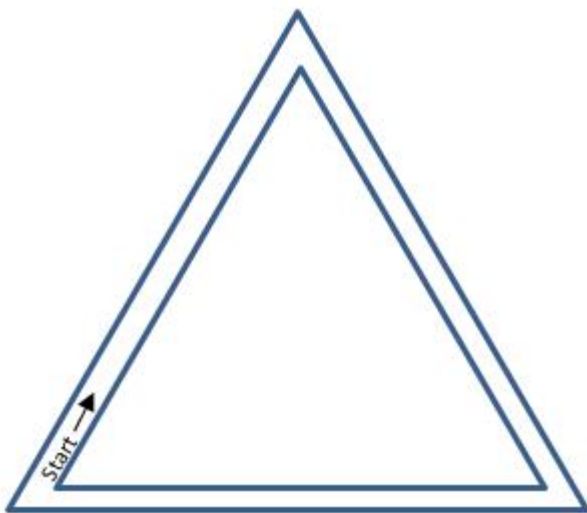
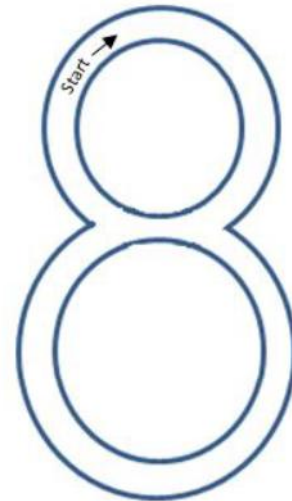
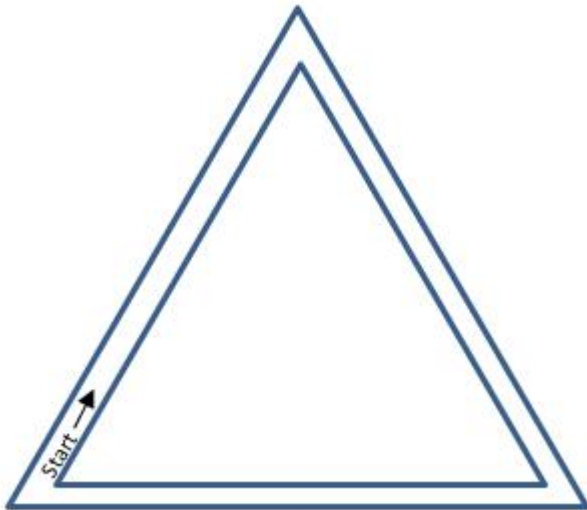
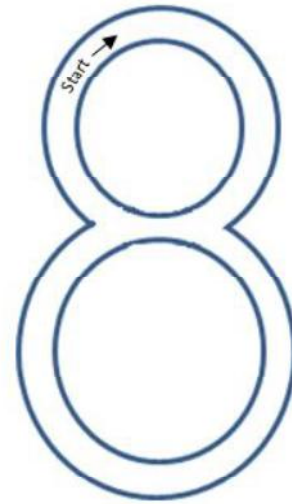
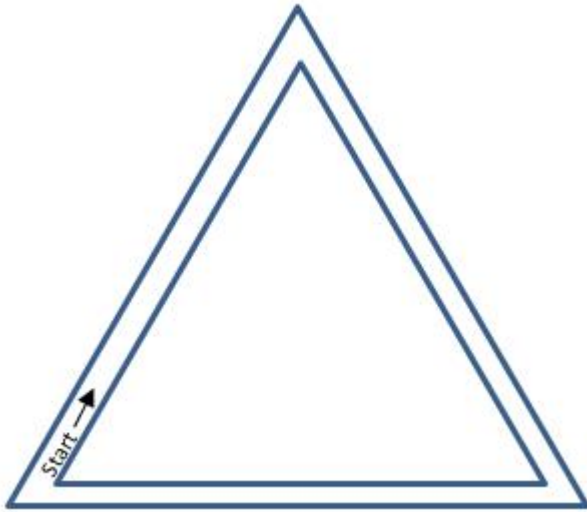
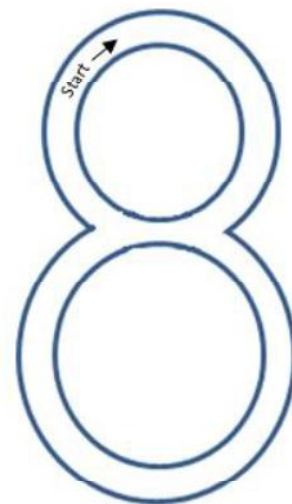
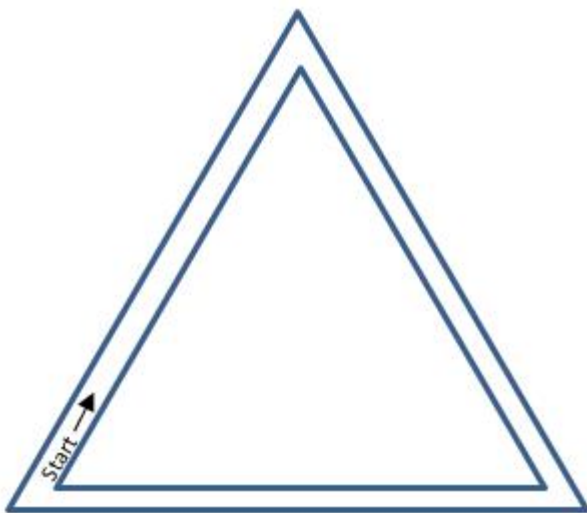
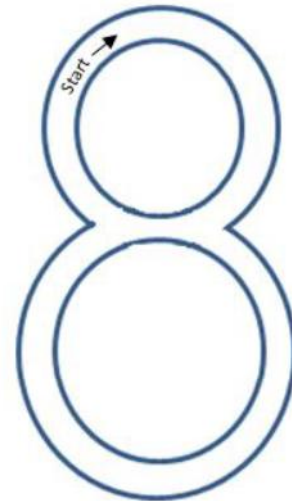
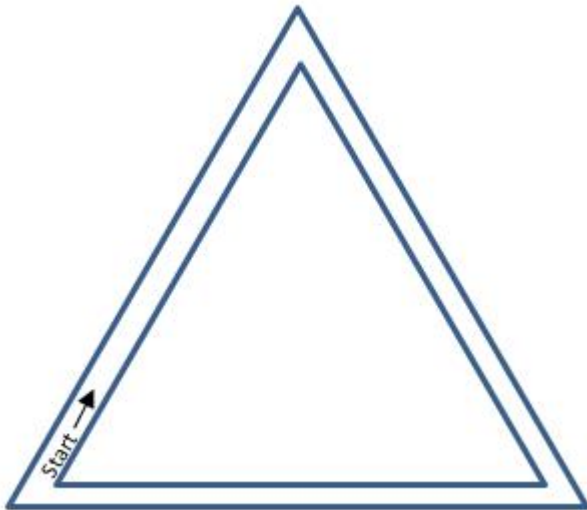
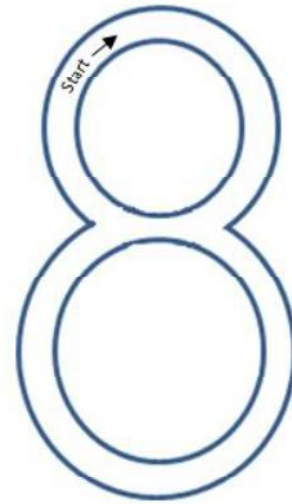
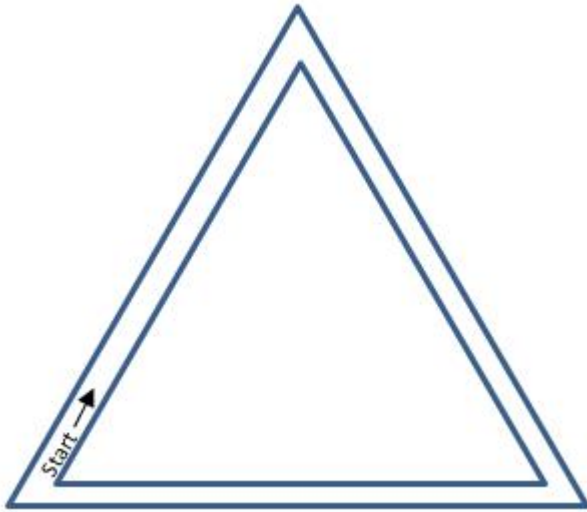


Diagram sheets



Unit Quiz (Weeks 8-9)

Choose the correct answer in the following questions:

1) An action potential:

- a) involves the movement of negative ions to depolarize the membrane
- b) involves the movement of negative ions to repolarize the membrane
- c) is initiated by potassium ion movements
- d) is required to produce a nerve impulse

2) Immediately after an action potential is begun, which one of the following ions rapidly diffuses out of the cell into the tissue fluid:

- a) potassium
- b) calcium
- c) sodium
- d) chloride
- e) magnesium

3) Collections of axons inside the CNS are called:

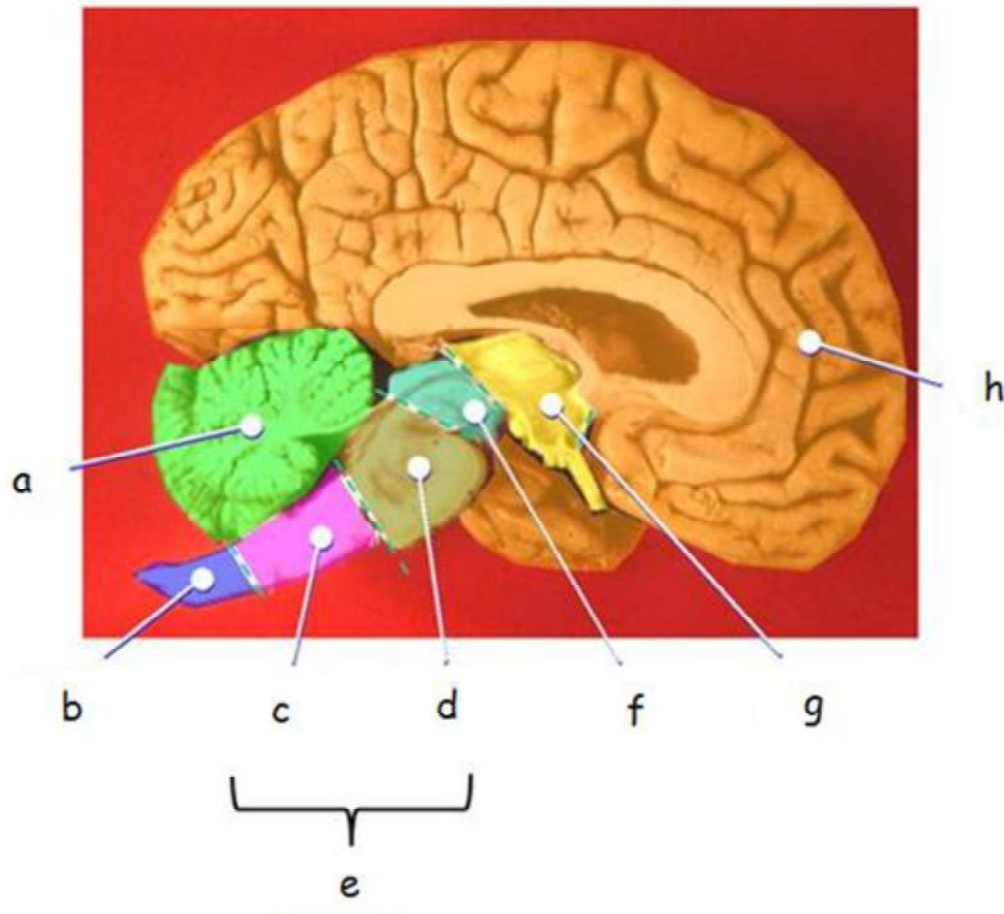
- a) dendrites
- b) neurons
- c) nerves
- d) soma

4) The area of the brain responsible for the control of activities such as heart rate, breathing, blood pressure, and swallowing are located in the:

- a) hypothalamus
- b) pons
- c) cerebrum
- d) midbrain
- e) medulla oblongata

9) Correctly identify the following structures within the following image. Use the words from the word bank below:

Sections of the brain



WORD BANK: pons, brainstem, cerebellum, midbrain, spinal cord, cerebrum, diencephalon, medulla oblongata

a)

e)

b)

f)

c)

g)

d)

h)

Unit Quiz Answer Key

1) d

2) a

3) c

4) e

5) F

6) F

7) Polarization - a neuron at rest which contains a negative charge due to an abundance of positively-charged sodium ions outside the neuron as compared to the inside

Depolarization - a wave of sodium ions enters the neuron causing the neuron to maintain a more positive charge

Repolarization - the movement of larger positively-charged potassium ions from the inside the neuron which lowers the neuron's charge back to negative

Hyperpolarization - an excessively negative charge within the neuron caused by too many potassium ions leaving the cell

Refractory period - resting stage; period of time in which the sodium/potassium pump equalizes the charge of the neuron by driving three sodium ions out of the neuron for every two potassium ions it allows back in until the cell's resting potential has been reached

8) Damage to the cerebellum can result in balance impairment and a lack of equilibrium within the body. The same tests could be applied to a person with a damaged cerebellum as to an inebriated person, such as having the person touch their nose or walk a straight line.

9) Word match from picture:

a) cerebellum

b) spinal cord

c) medulla oblongata

d) pons

e) brainstem

f) midbrain

g) diencephalon

h) cerebrum