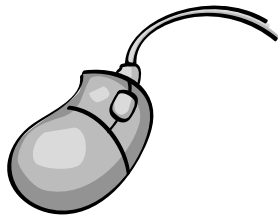
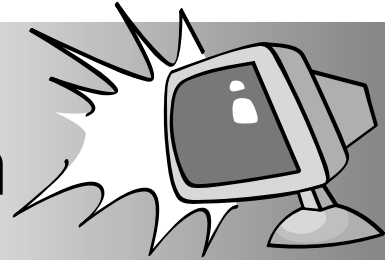


Name _____

Date _____



Exploring The New Science of Addiction

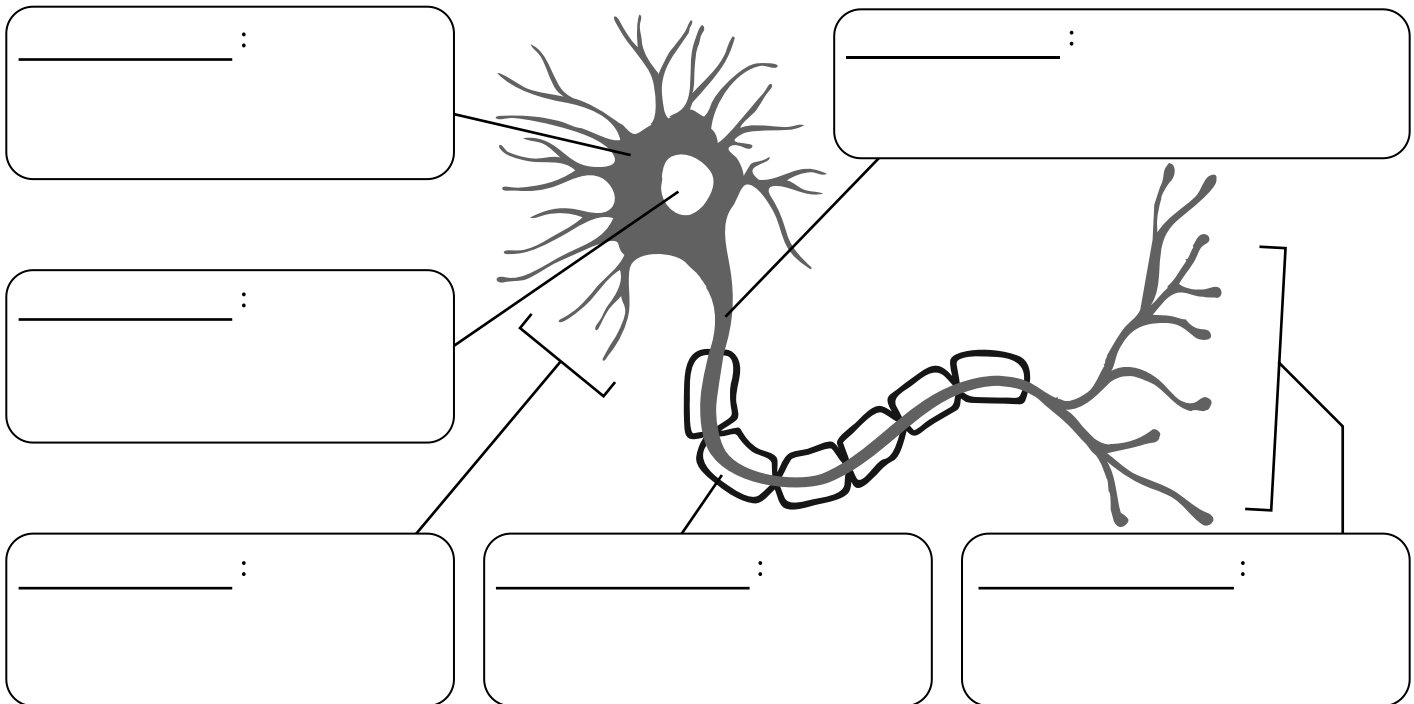


Log on to: <http://gslc.genetics.utah.edu/units/addiction> and explore this module to find the answers to the questions below.

Hint: the Search feature on this website may or may not help you find what you are looking for; it is best to go through the module to find the answers.

Natural Reward Pathways Exist in the Brain

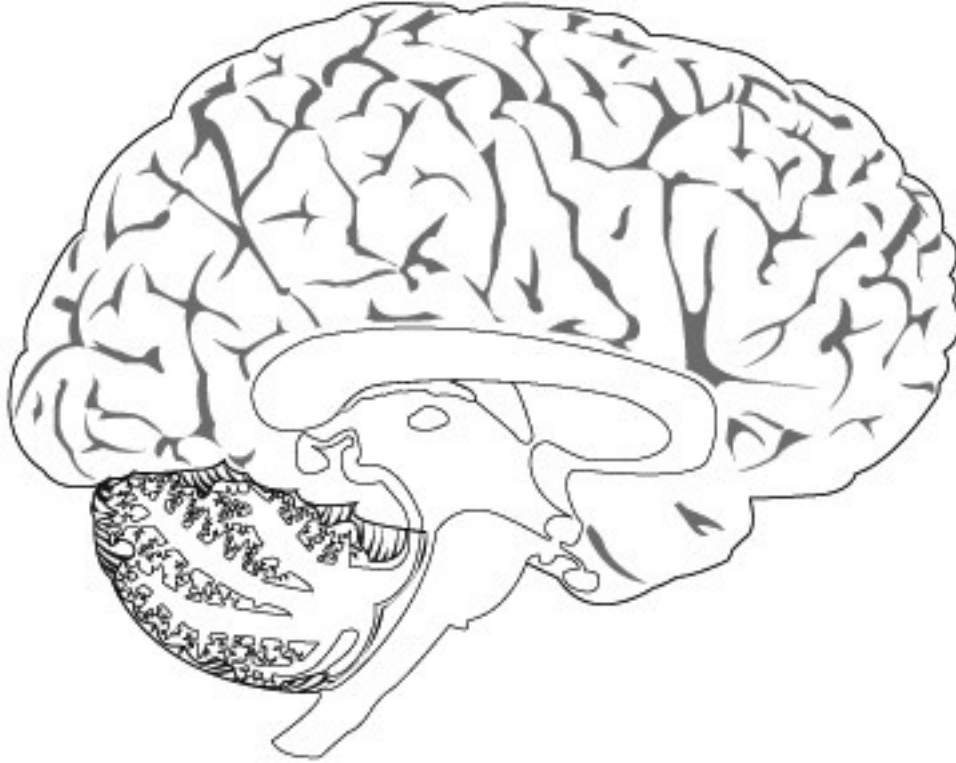
1. *Make a Mad, Mad, Mad Neuron*, label each part on the neuron below and give a brief description of each part's function.



Name _____

Date _____

2. On the brain below, roughly sketch in and label: A) the Reward Pathway, B) the area of the brain responsible for behavior and C) the area of the brain responsible for memory.



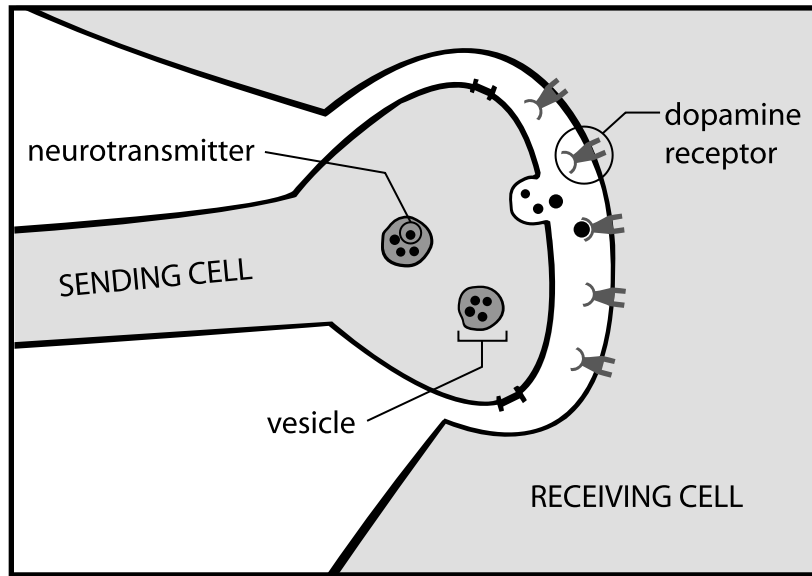
The components of the Reward Pathway are:

The Reward Pathway is responsible for:

Name _____

Date _____

3. *Crossing the Divide: How Neurons Talk to Each Other* (view the movie to answer the questions below).



Describe what is happening in the diagram above.

Assuming the sending cell started at rest, list the events that had to happen in order to get it to this stage.

What events will transpire next in order to complete the message?

Name _____

Date _____

Learn More: *The Other Brain Cells*

Glial Cell Type	Diagram	Function
Oligodendrocytes		
Microglia		
Astrocytes		

Drugs Alter the Brain's Reward Pathway

4. Categorize the *Drugs of Abuse*

Stimulant

Depressant

Other

5. Observe the mice at the *Mouse Party*.

Where is the action of each drug taking place?

All of the drugs affect the natural balance of neurotransmitters in the brain. T F

Learn More: *Drug Delivery Methods*

Name two reasons why the method of drug delivery is an important factor in addiction.

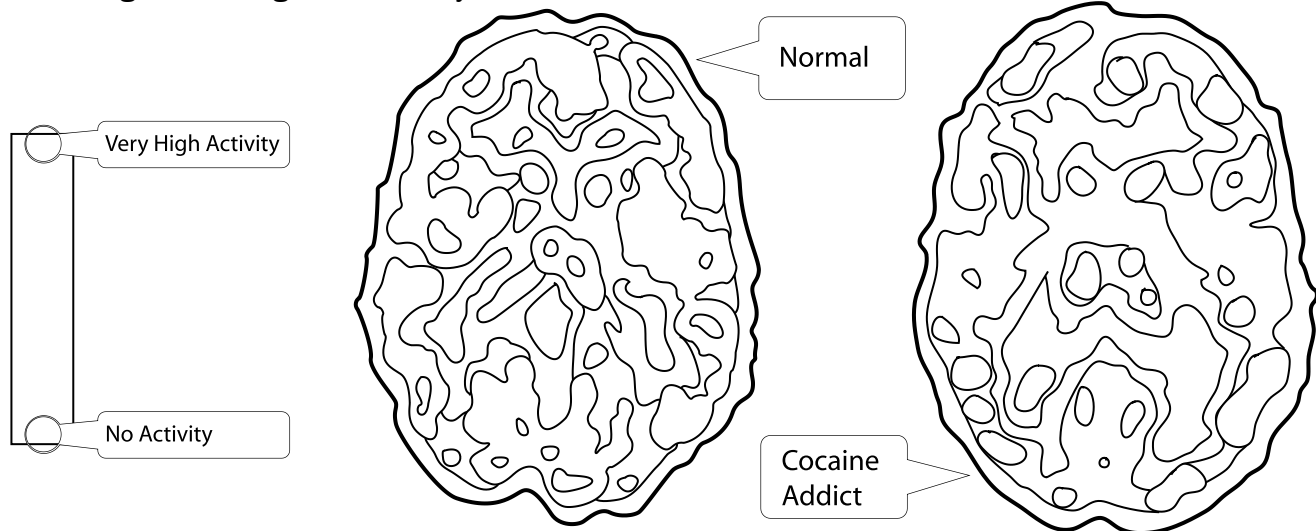
Name _____

Date _____

6. Play *Cerebral Commando* until you win. What was the most effective strategy?

7. Color in the PET scan images of the normal-functioning brain and the brain of a cocaine addict below:

PET Images Showing Brain Activity:



Learn More: Brain Imaging Technologies

A PET scan involves the following steps:

Step one:

Step two:

Step three:

Name _____

Date _____

Learn More: *Brain Imaging Technologies (cont'd.)*

Compare:	PET	MRI
Measures		
Electromagnetic Wave Detected		

Learn More: *Beyond the Reward Pathway*

Aside from memory, motivation and reward, what other functions controlled by the brain would you expect drugs that interfere with dopamine to affect?

List the main role(s) for each neurotransmitter below:

Dopamine:

Serotonin:

GABA:

Glutamate:

Name _____

Date _____

Genetics is an Important Factor in Addiction

8. There is one addiction gene that has been identified by researchers. T F
9. Become the *Pedigree Investigator* and complete the pedigree for the Marshall family. Does the pedigree indicate a possible genetic component to nicotine addiction?
10. List the risk factors for nicotine addiction present in the Marshall family.

Learn More: *Discovering Addiction Genes Using the Candidate Gene Approach*

Briefly explain why the CHRNA4 gene might be a likely candidate gene for nicotine addiction.

Learn More: *Mice Are Good Model Organisms for Addiction Research*

Reasons why mice are a good model organism for addiction research:

1.

2.

3.

Name _____

Date _____

Timing and Circumstances Influence Addiction

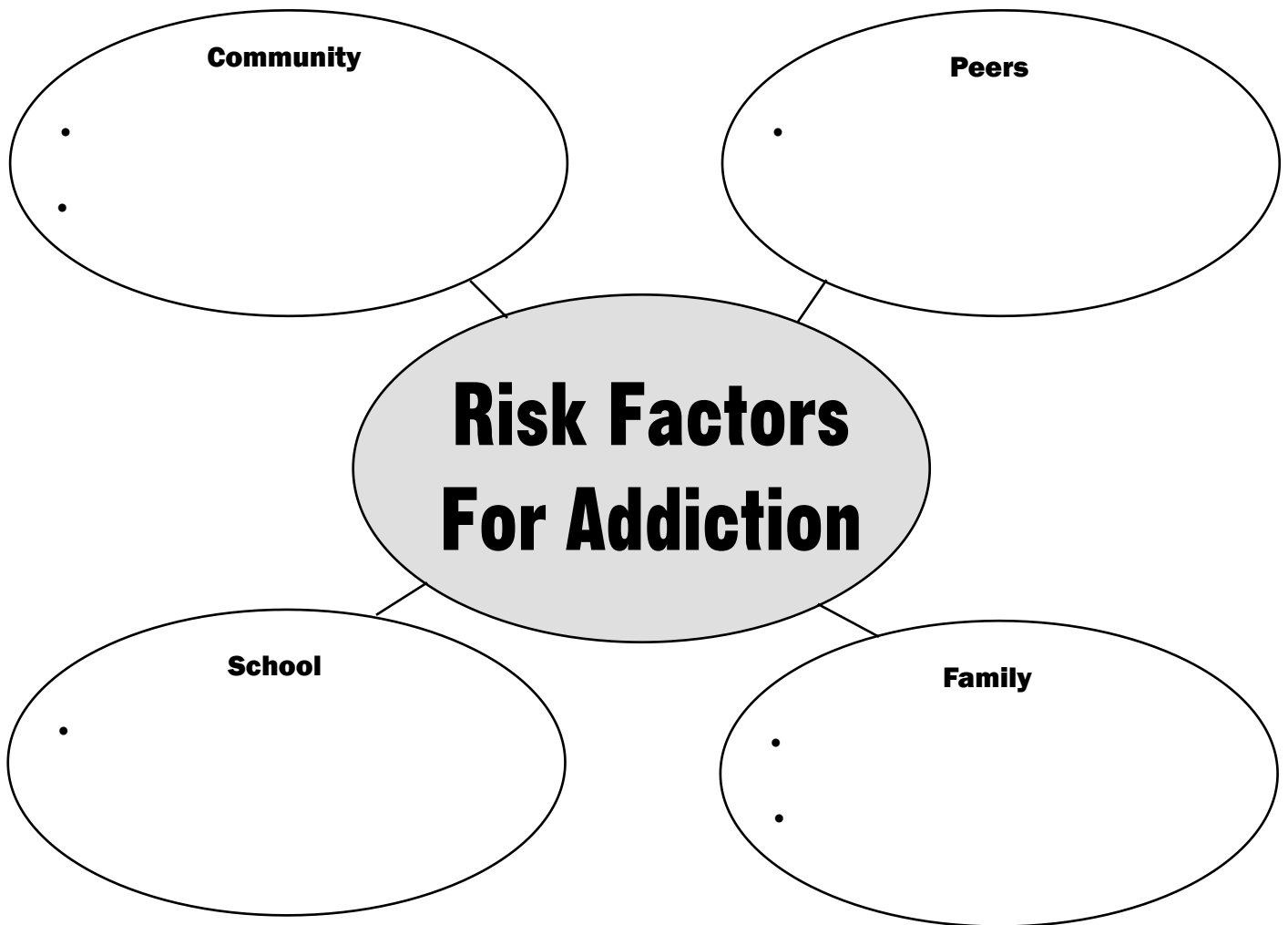
11. Name two reasons why the adolescent brain is particularly susceptible to developing a lifetime drug addiction.

1.

2.

Learn More: *Environmental Risk Factors for Addiction*

Fill in the circles below with the appropriate risk factors



Name _____

Date _____

Challenges and Issues in Addiction

12. Which challenge/issue discussed on this page do you find most compelling? Why?

Name _____

Date _____

13. *Summary*

Fill in the boxes below to explain how each contributes to our new understanding of addiction:

