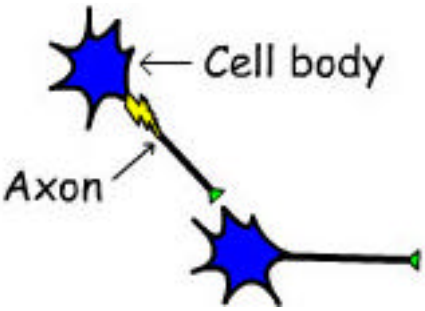
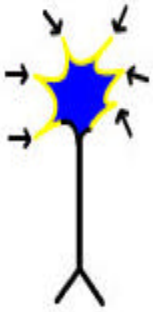
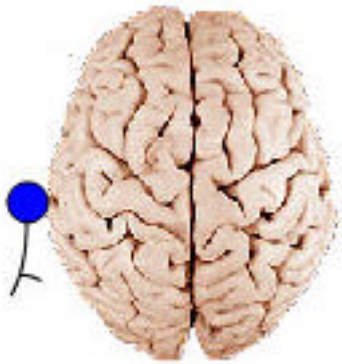
# Sam's Brainy Adventure

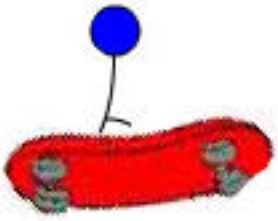
by

Eric H. Chudler and Sam Chudler







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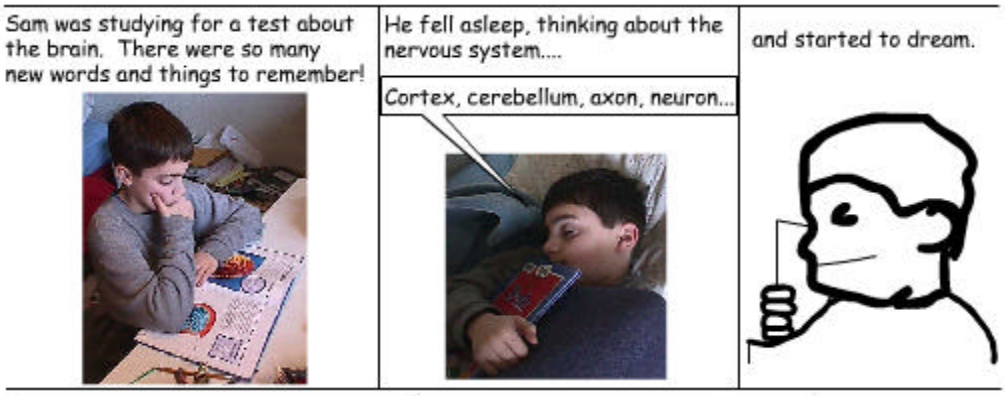
1

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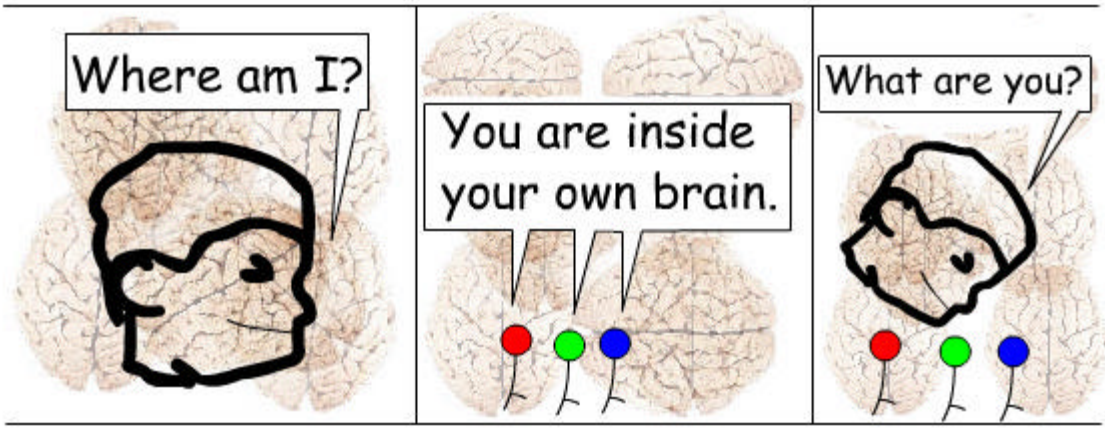


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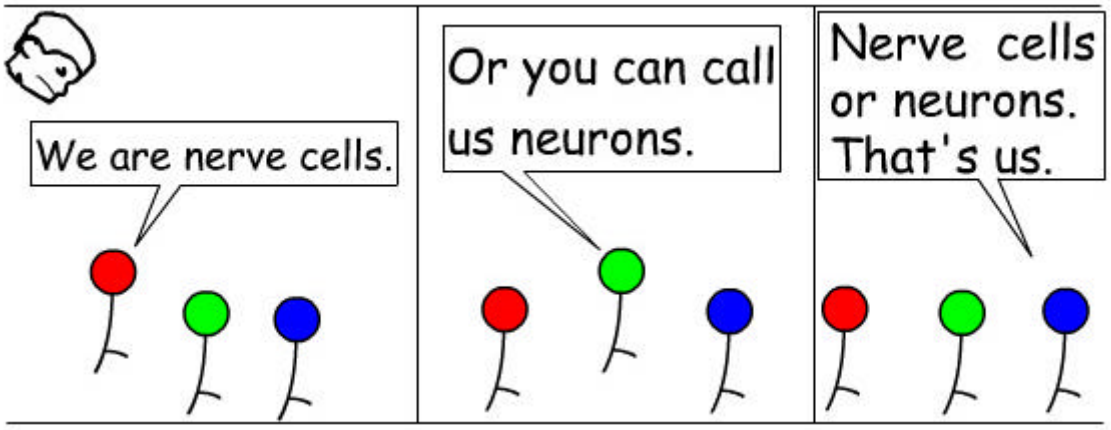


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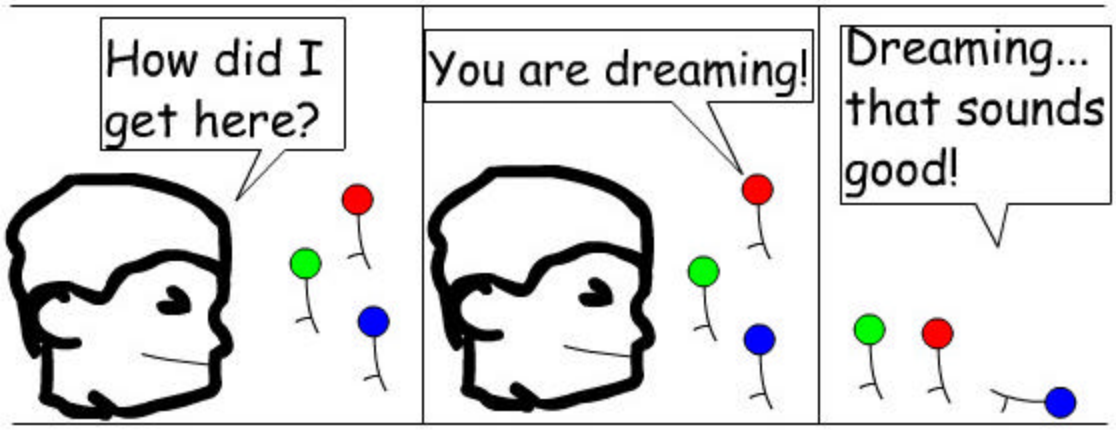

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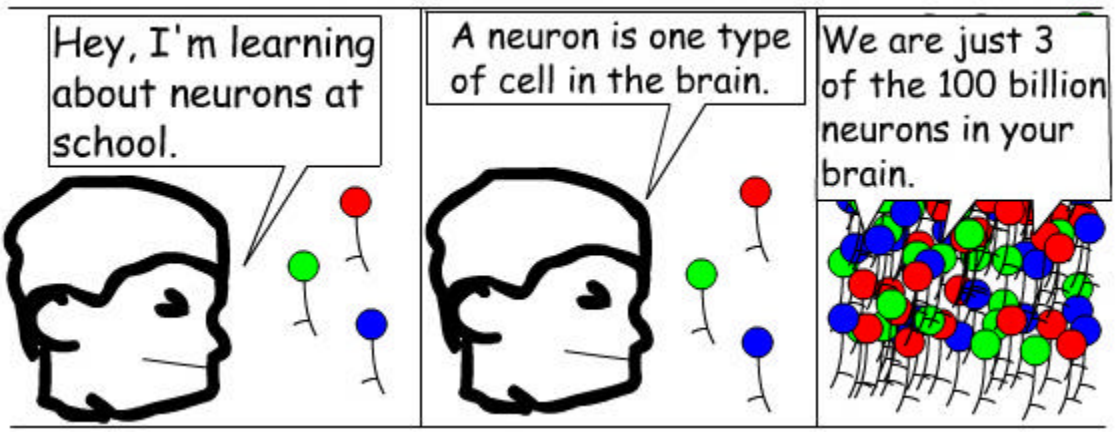
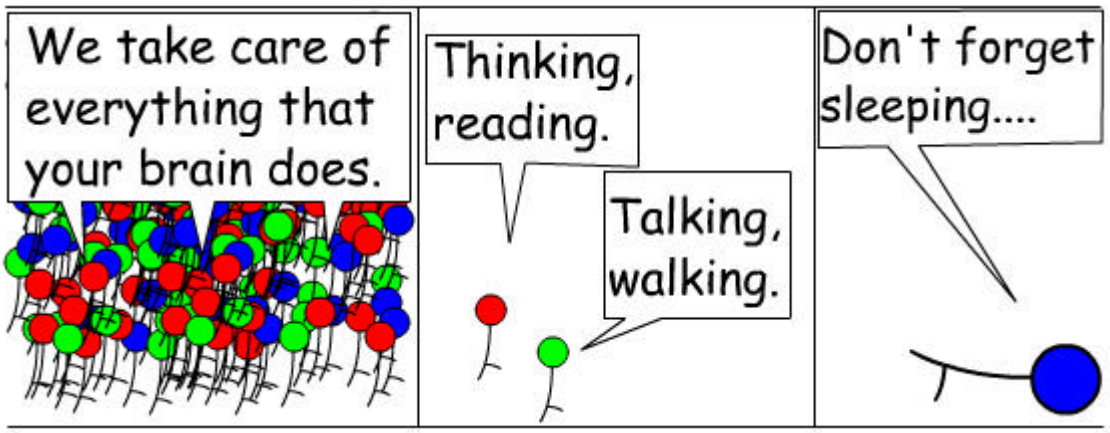
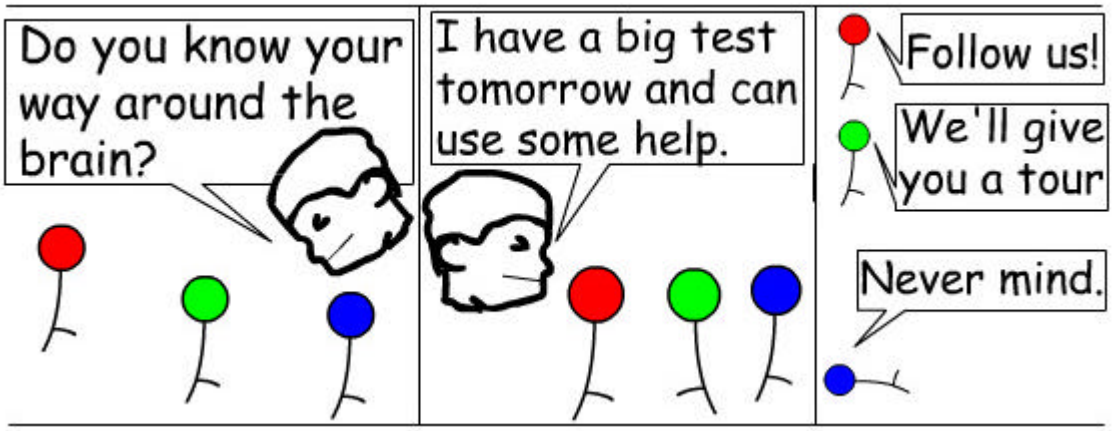

Hey, I'm learning about neurons at school.
A neuron is one type of cell in the brain.
We are just 3 of the 100 billion neurons in your brain.

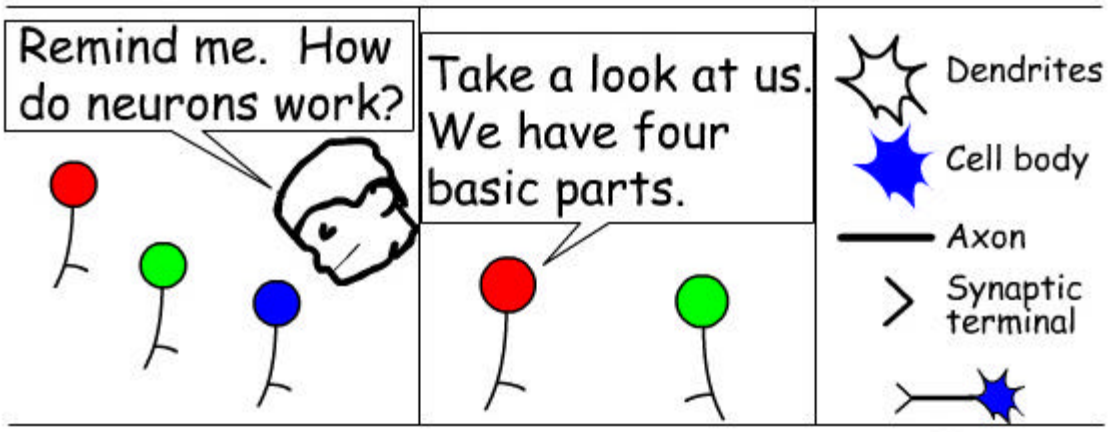
6


We take care of everything that your brain does.
Thinking, reading.
Talking, walking.
Don't forget sleeping....

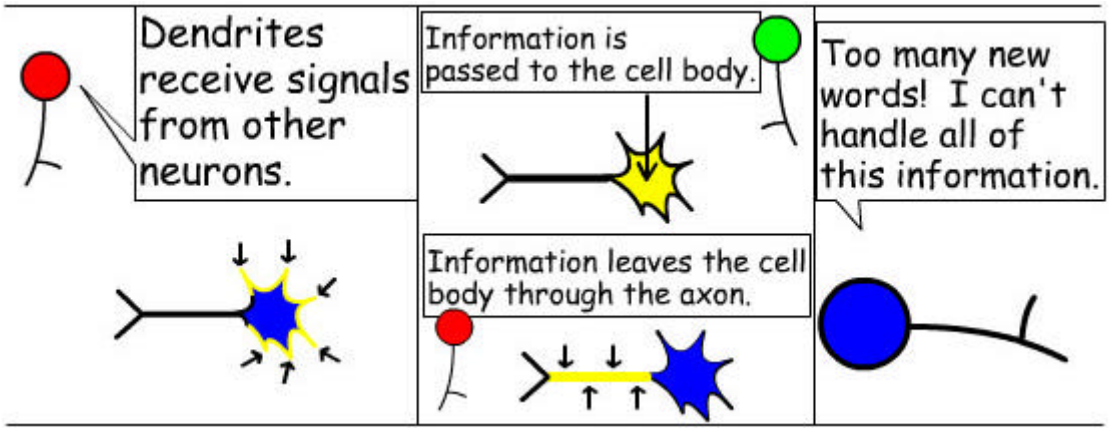
7


Do you know your way around the brain?
I have a big test tomorrow and can use some help.
Follow us!
We'll give you a tour
Never mind.

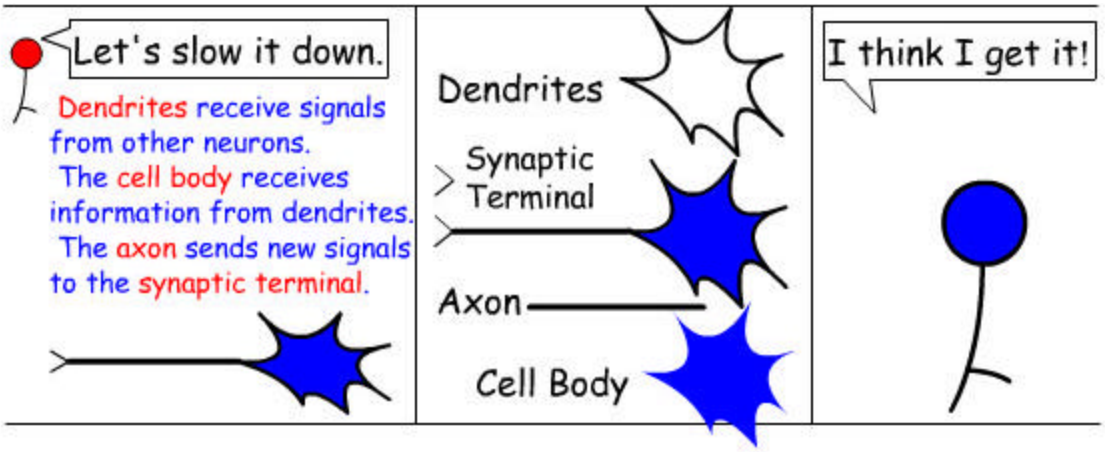
8


Remind me. How do neurons work?
Take a look at us. We have four basic parts.
Dendrites
Cell body
Axon
Synaptic terminal

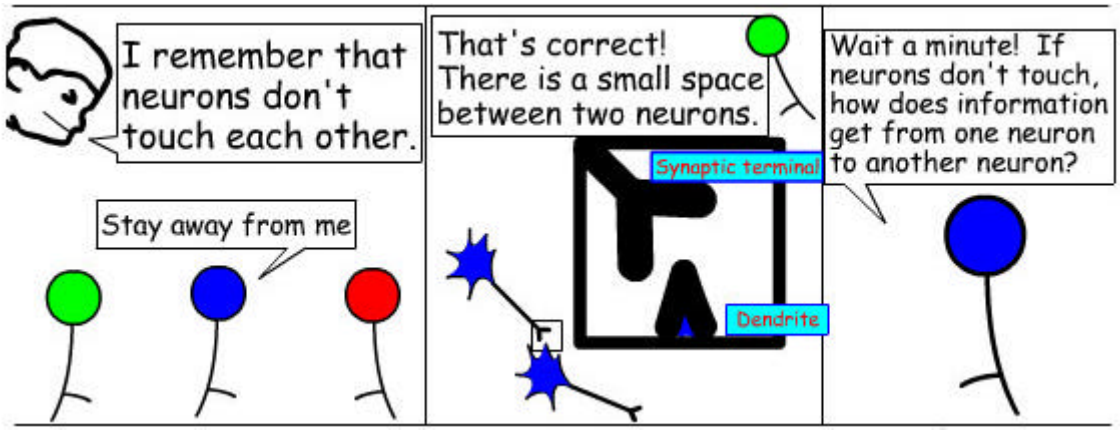
9


Dendrites receive signals from other neurons.
Information is passed to the cell body.
Information leaves the cell body through the axon.
Too many new words! I can't handle all of this information.

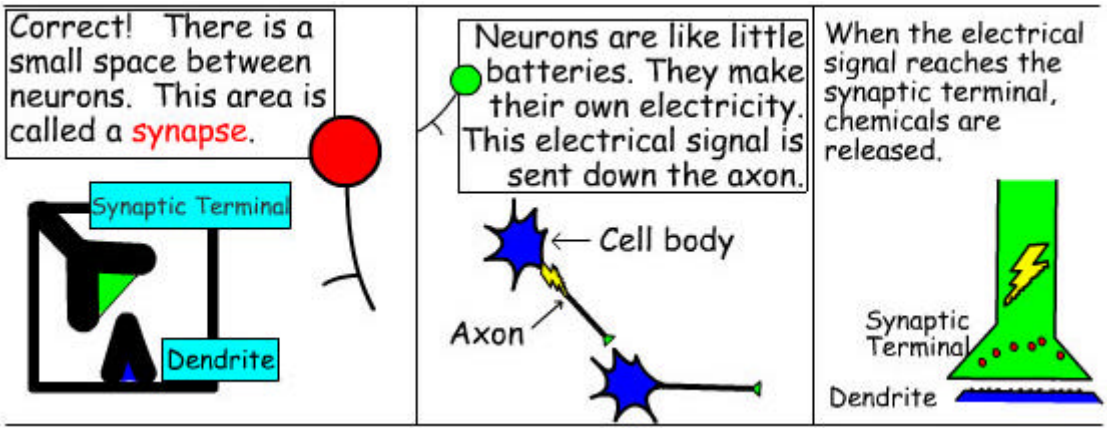
10


Let's slow it down.
Dendrites receive signals from other neurons.
The cell body receives information from dendrites.
The axon sends new signals to the synaptic terminal.
Dendrites
Synaptic Terminal
Axon
Cell Body
I think I get it!

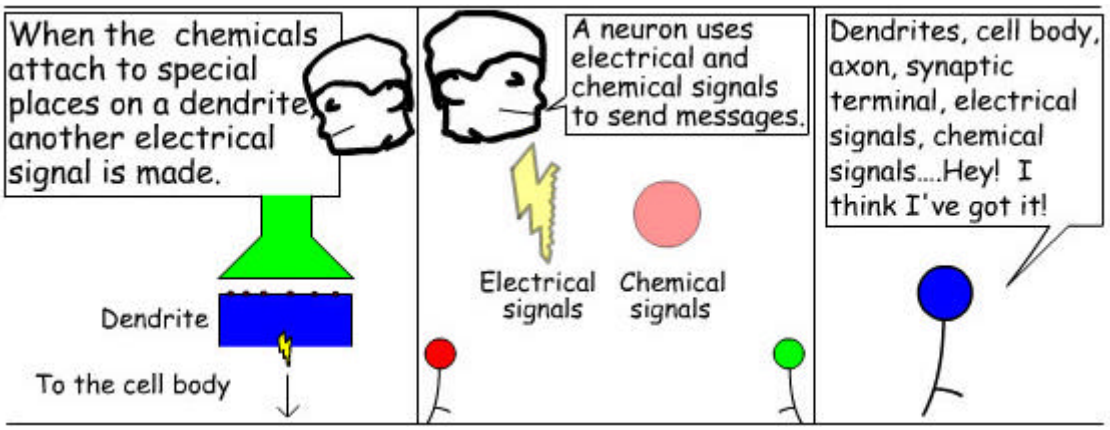
11


I remember that neurons don't touch each other.
Stay away from me
That's correct! There is a small space between two neurons.
Synaptic terminal
Dendrite
Wait a minute! If neurons don't touch, how does information get from one neuron to another neuron?

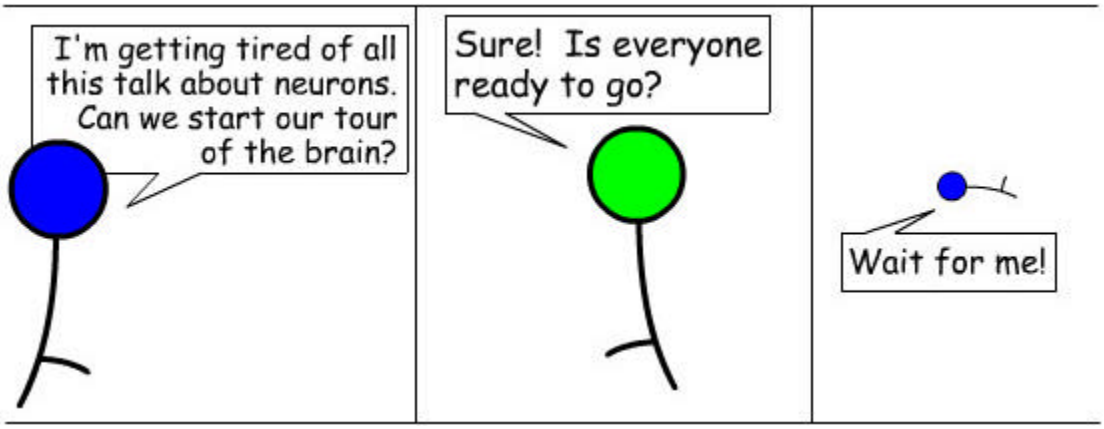
12


Correct! There is a small space between neurons. This area is called a synapse.
Synaptic Terminal
Dendrite
Neurons are like little batteries. They make their own electricity. This electrical signal is sent down the axon.
Cell body
Axon
When the electrical signal reaches the synaptic terminal, chemicals are released.
Synaptic Terminal
Dendrite

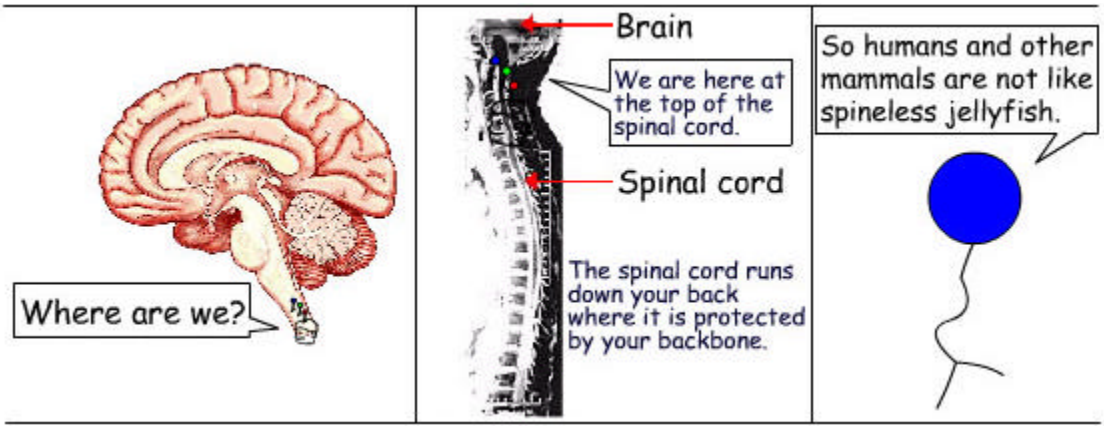
13


When the chemicals attach to special places on a dendrite another electrical signal is made.
Dendrite
To the cell body
A neuron uses electrical and chemical signals to send messages.
Electrical signals
Chemical signals
Dendrites, cell body, axon, synaptic terminal, electrical signals, chemical signals....Hey! I think I've got it!

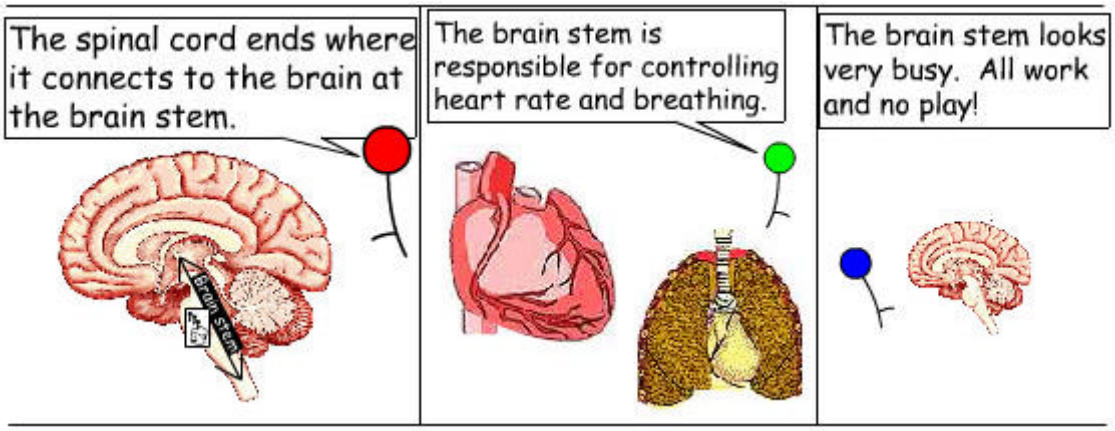
14


I'm getting tired of all this talk about neurons. Can we start our tour of the brain?
Sure! Is everyone ready to go?
Wait for me!

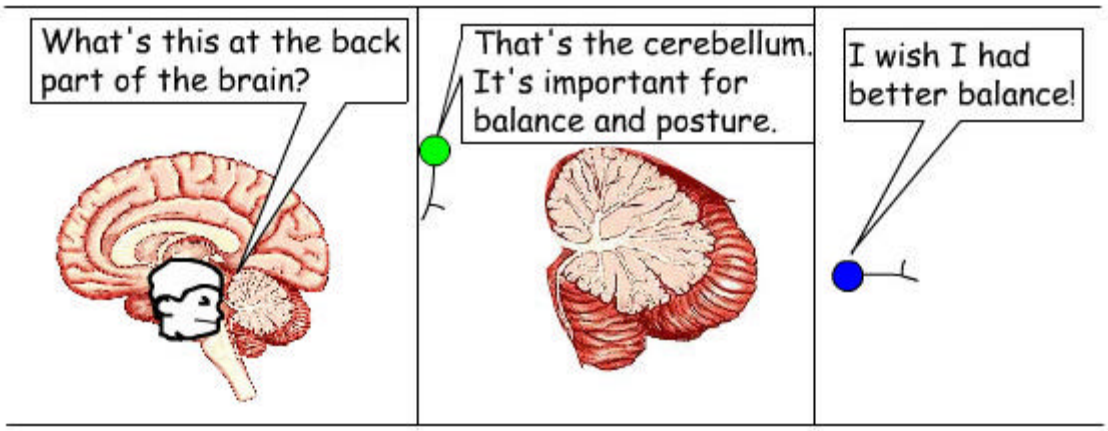
15


Where are we?
Brain
We are here at the top of the spinal cord.
Spinal cord
The spinal cord runs down your back where it is protected by your backbone.
So humans and other mammals are not like spineless jellyfish.

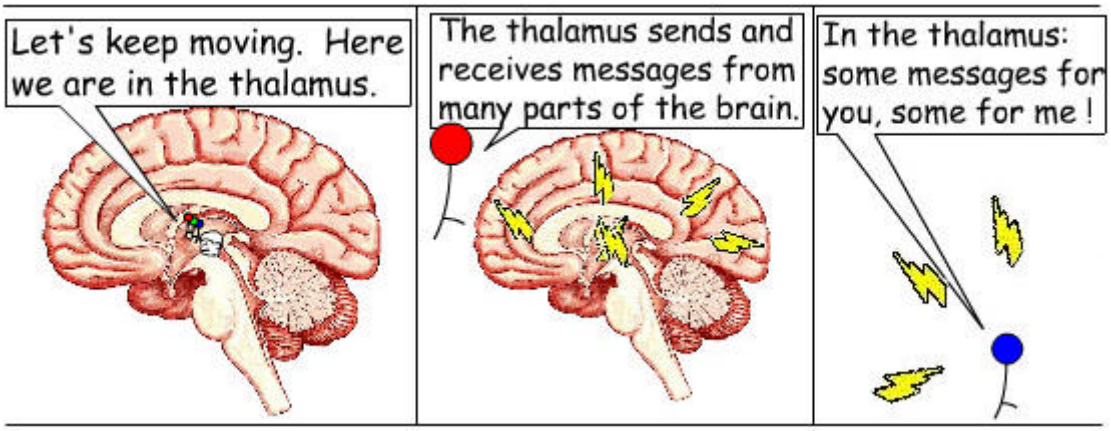
16


The spinal cord ends where it connects to the brain at the brain stem.
Brain Stem
The brain stem is responsible for controlling heart rate and breathing.
The brain stem looks very busy. All work and no play!

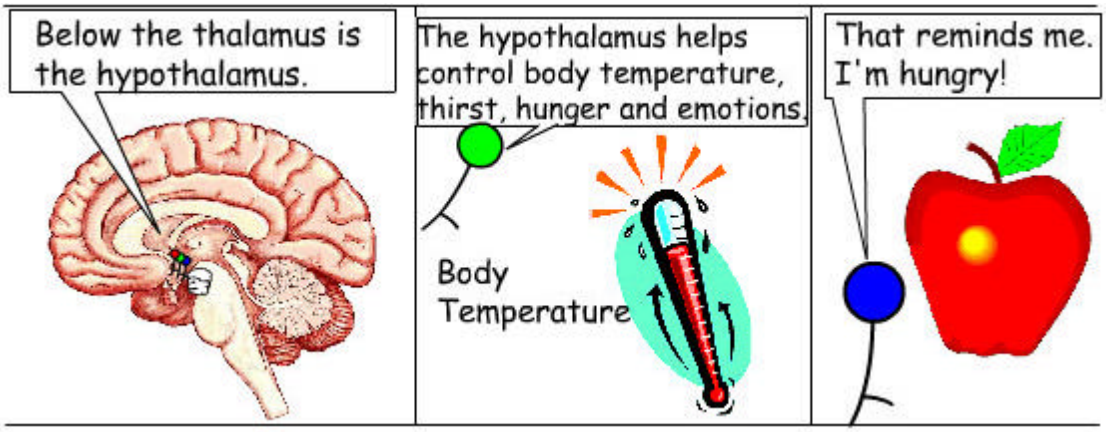
17


What's this at the back part of the brain?
That's the cerebellum. It's important for balance and posture.
I wish I had better balance!

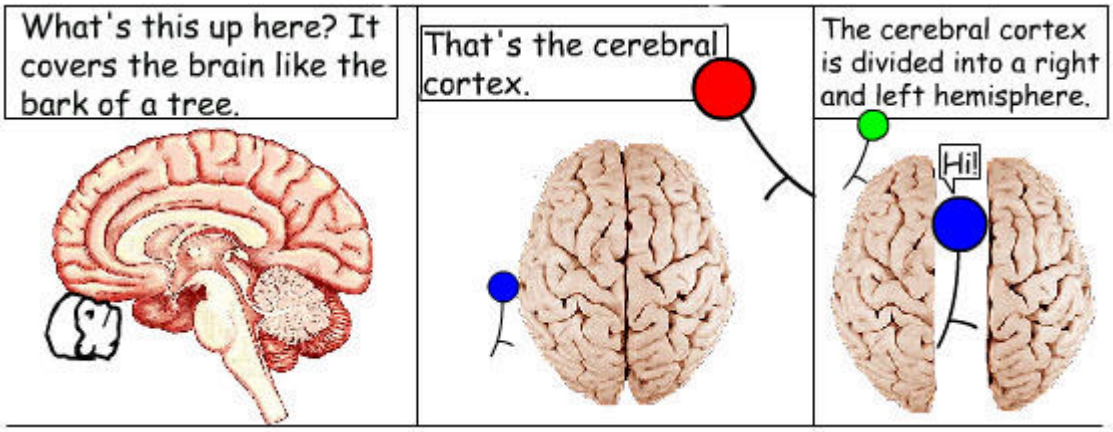
18


Let's keep moving. Here we are in the thalamus.
The thalamus sends and receives messages from many parts of the brain.
In the thalamus: some messages for you, some for me !

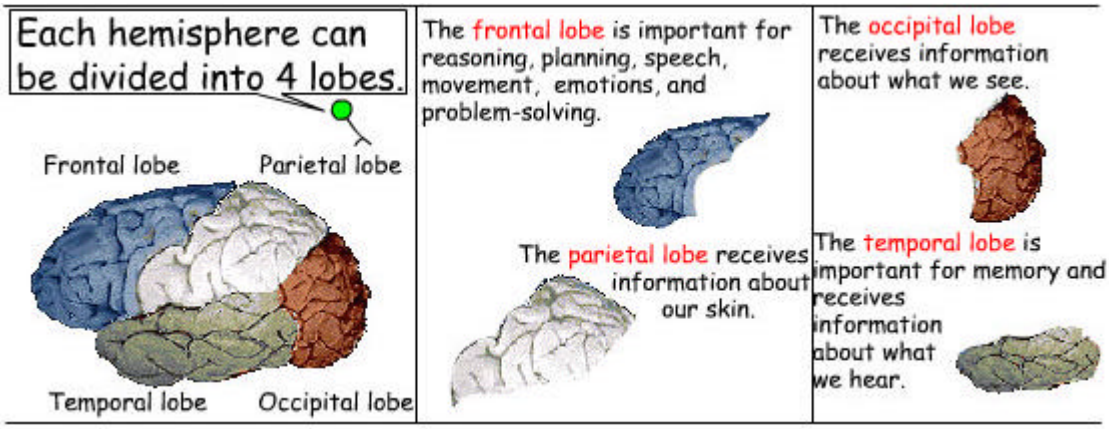
19


Below the thalamus is the hypothalamus.
The hypothalamus helps control body temperature, thirst, hunger and emotions.
Body Temperature
That reminds me. I'm hungry!

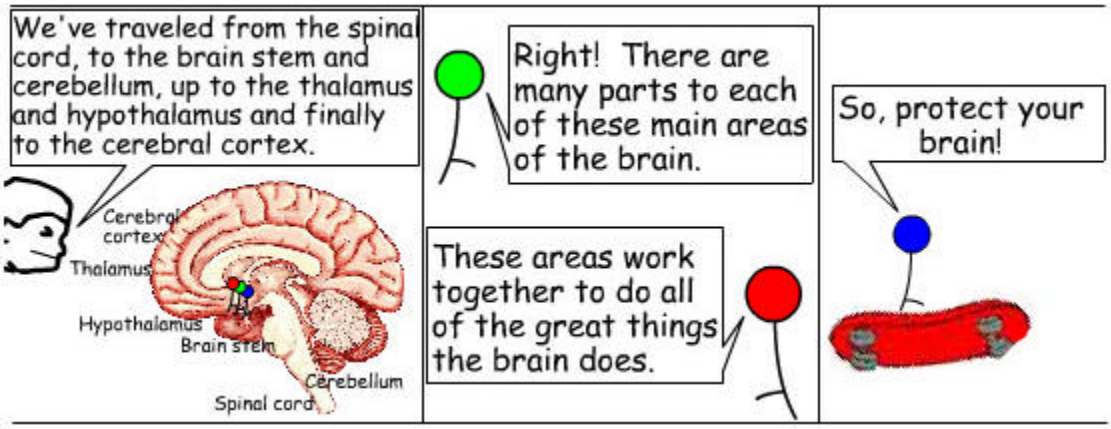
20


What's this up here? It covers the brain like the bark of a tree.
That's the cerebral cortex.
The cerebral cortex is divided into a right and left hemisphere.
Hi!

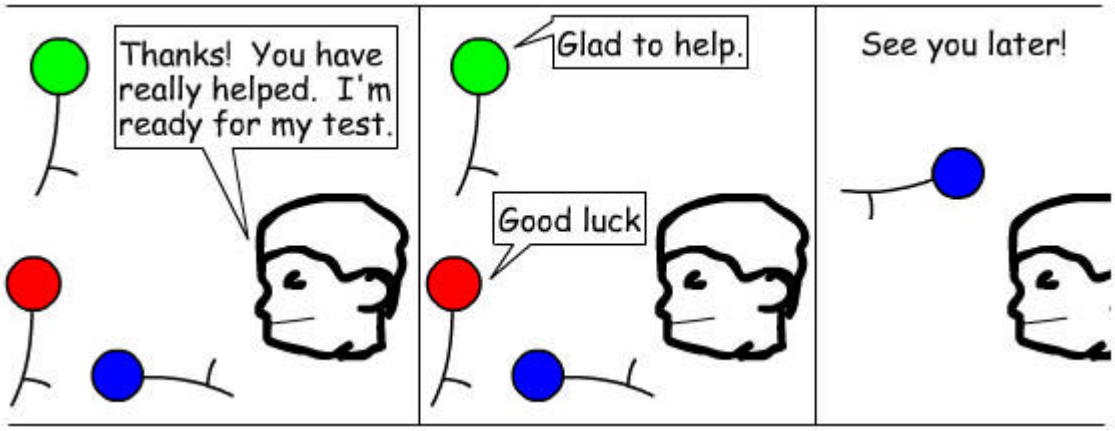
21


Each hemisphere can be divided into 4 lobes.
Frontal lobe
Parietal lobe
Temporal lobe
Occipital lobe
The frontal lobe is important for reasoning, planning, speech, movement, emotions, and problem-solving.
The parietal lobe receives information about our skin.
The occipital lobe receives information about what we see.
The temporal lobe is important for memory and receives information about what we hear.

22


We've traveled from the spinal cord, to the brain stem and cerebellum, up to the thalamus and hypothalamus and finally to the cerebral cortex.
Cerebral cortex
Thalamus
Hypothalamus
Brain stem
Cerebellum
Spinal cord
Right! There are many parts to each of these main areas of the brain.
These areas work together to do all of the great things the brain does.
So, protect your brain!

23


Thanks! You have really helped. I'm ready for my test.
Glad to help.
Good luck
See you later!

24


That was a strange dream!
Time for school.
I'm ready for my test.