



The Brain Changes All the Time (🌈 A Brain Facts Story) (5th Grade – 10-11 yrs.)

This story describes how because the world you live in is always changing, your behaviors have to change and so does your brain.

- 🌈 Being able to adapt to changes in your world helps you to survive.
- 🌈 Everything that you do changes your brain. Your brain has the ability to adapt – known as neuroplasticity.
- 🌈 Everything about your brain is changing. This includes the number of neurons and glial cells that make up your brain, the connections between those cells, and the blood vessels that carry things in and out of your brain – everything is always changing.

🌈 SLIDE #1 - INTRODUCTION:

Good Morning (Afternoon)!

My name is _____ and I (describe who you are and give your relation to neuroscience – ex. you are a Neuroscientist, you study neuroscience, you have a friend that is a neuroscientist or you have recently been learning a lot about neuroscience).

Neuroscience, that's a really big word! But, a neuroscientist is a person who knows a lot about the brain.

I am here today to talk to you about how you can help to make your brain healthy – feeling good. It is REALLY easy and anyone can do it.

I love to talk about Brain Health because it's SPECTacular!!! SPECTacular means "GREAT". When your brain is SPECTacular, you are a happy and healthy person.

This is a Brain Facts story. We have to know and understand some things about the brain if we are going to understand how to keep our brain healthy.

So, let's see how you can keep your brain healthy.

🌈 SLIDE #2 – THE BRAIN CHANGES ALL THE TIME

Your brain does everything to help you to live in this world and we all know that this world is always changing.

Because the world is always changing, your brain has to always be changing too.

This story, "The Brain Changes All the Time", will help you to understand that because your brain can change, you can handle any kind of change that the world has to offer.

🌈 SLIDE #3 – HOW DOES THE WORLD CHANGE?

There are 2 ways that we can think about how the world changes.

The first is the world that *you* know changes – or your physical environment changes.

The second is that new innovations change the world. *Innovating* means making a change to something or creating something new. Technology is among the biggest changes that you will see in your lifetime. Technological changes let humans come up with new inventions to make our life easier and, hopefully, to make the world a better place.

SLIDE #4 – GROWING UP

When we say “the world changes” that includes our physical environment.

But...what is our physical environment? Your physical environment is the world that YOU see...your world. And your world may be different than my world – because people live and see different things.

Think about it – people grow up! As you grow up, you need and do different things. Your world – the people and things that are around you changes.

When you were younger, your world – or your physical environment – consisted of your home, your neighborhood, and your family.

When you were a baby, your world was very small. Babies pretty much eat, sleep, and make messy diapers – so they do not even have to leave the house to survive. People taking care of the baby bring the baby everything they need.

Even at this young age, with a relatively small world (physical environment), a baby’s brain is growing and changing. (Think about how small a baby’s head is and how big your head is.) A baby’s behavior and how the baby interacts with the world is also changing.

QUESTION: What does a baby do to let the people taking care of them know that they need something – like food or a diaper change?

That is right – they cry. The baby has learned that if they cry when they need something, that people bring them what they need.

SLIDE #5 – WORLD AND BEHAVIORS CHANGE

As you get older, your world may consist of home and school.

Now, people do not bring you everything that you need anymore – so you need to move around more in your environment.

You need to learn how to get food and you can no longer use diapers. You need to learn how to find a bathroom to use – whether you are at home or at school.

You also no longer just cry to get the things that you need, you use your words – because you have learned how to talk.

You are doing a lot more behaviors. It is your brain that lets you do those behaviors because your brain is continuing to grow and change.

SLIDE #6 – WORLD CHANGES AS YOU GROW UP

Throughout your entire life, the world around you – or your physical environment is going to change.

You get older and the world around you changes. You may graduate high school and then go to college and then get a job. Or, you may just get a job right away.

You may have to move to different parts of the country or even the world.

The people around you are also going to change.

At first, it is your family and people in the neighborhood that are in your world.

As you grow, there are also teachers, coaches, and friends who become part of your world.

When you become an adult, there are lots of other people that you add to your world too.

To be able to change your behaviors to adapt to all the changes in your physical world, your brain needs to be able to change.

SLIDE #7 – INNOVATIVE CHANGES

Changes in your world also involve changes in technology and other innovations that help to make our ability to survive in the world easier. These changes will also hopefully make the world a better place.

The technology that we use in the world is always changing because people like to find new and better ways to do things.

To be able to use technology, our brains need to be able to change and adapt.

Students now use computers a lot in school, but before computers students used different ways to learn.

Instead of searching for information on the internet, we had to go to the library and find a book that had the information. Our brains had to learn how to use books for research.

Now, however, we usually do have access to a computer so we can find out the information using the internet. But our brains had to learn how to use a computer to find information online too,

Because there is always learning that we need to do – we need to find the best way to do it given the technology that we have available at that moment.

Our brain has to be able to learn and change so we can accomplish any task...including getting our school work done.

Because, if for some reason all the computers in the world stopped working, we still need to learn...and that usually means doing homework.

SLIDE #8 – TECHNOLOGY

Before there were telephones, cell phones, and tablets, people used to communicate by talking to each other in person or by writing letters by hand.

That meant that you could only talk to people who lived close to you or it took a long time to communicate with people far away. Letters were carried by horses, then trains, by cars and planes.

Now, we can “talk” to people anywhere in the world in a matter of seconds – and we do not even have to use our voices. We can use our fingers to type messages that they receive instantly!!

We can also see people while we talk to them, even if they live somewhere else in the world.

Technology is always changing and we need to learn how to use the technology so we can live in this world. That means our brain and behaviors have to change.

Think about it...when you were younger, you may have played with a Nintendo or Xbox. Now there is virtual reality – like Oculus. What will there be when you get older?

SLIDE #9 – NEUROPLASTICITY

We keep talking about the brain changing. Well, there is a big word that describes how the brain changes – it is called Neuroplasticity.

While we know a lot about how the brain works, there is still so much that we do not know about how the brain works.

We do know that EVERYTHING that you do changes your brain – it causes neuroplasticity.

Everything that you see, hear, feel, taste, and smell changes your brain.

Every emotion that you have and every movement that you do changes your brain.

Because everything that you do changes your brain – causing neuroplasticity, this makes your brain different than any other person's brain.

SLIDE #10 – DIFFERENT BRAINS

We know that everyone has a brain, but we also know that our brains are different because we all have done different things to change our brains.

We all have different brains that make us who we are. And, we are all different people.

That is why different people can see, hear, do the same things, but they will have different thoughts, feelings and opinions about those things.

SLIDE #11 – BRAIN CHANGES

Your brain changes with everything that you do so that you can adapt to a changing world.

When neuroplasticity happens and changes your brain, this can make you feel good.

You can learn and remember information and then use this information to think about new ideas and ways to do things.

Or, you could learn how to bake cookies and then you could have a bake sale and donate the money to save animals at the animal shelter.

The changes that happen in your brain when you are coming up with new ideas or helping others will also help you feel good – so a win-win situation.

SLIDE #12 – BRAIN CHANGES

Sometimes the changes that happen in your brain can be bad changes, because they allow you to remember bad things which can make you upset and nervous.

Say you were riding your bike to school and a cat ran in front of you and you swerved to miss hitting the cat only to crash your bike into a tree. Luckily you were wearing your bike helmet to protect your brain, but you still hurt yourself pretty badly. Plus, it has made you afraid to ride your bike.

A few weeks later, your friend asks you if you want to go bike riding. You have not been on a bike since the accident, and you are a little nervous about going. You tell your friend that you cannot go because you have something else to do. Now, you feel bad because you wanted to go hang around with your friend – and you told a lie because you were embarrassed to tell your friend you were afraid to ride your bike.

This is an example of how your brain changing and letting you remember all the bad things about the bike accident can be bad.

The best way to deal with all the feelings you are having about the accident is to talk to someone about it. This way you can change your brain in a way that helps you calm down and helps you to remember all the fun times you had riding your bike.

This way you can change your brain in a good way because you will be dealing with the situation.

SLIDE #13 – WHAT ARE BRAIN CHANGES?

We keep talking about your brain changing – but what does that mean?

Again, there is still so much we do not know about how your brain is working – but, we do know that everything that you do causes something in your brain to change.

These changes may involve a number of cells in the brain (called neurons), how neurons work or even how much blood gets to different parts of the brain.

SLIDE #14 – NUMBER OF BRAIN CELLS

In some cases, a brain change will mean that there is a change in the number of actual cells you have in your brain.

The human brain is made up of billions of cells – the neurons and the glial cells. Your brain is constantly making new cells and getting rid of cells depending on the behaviors that you are doing.

You may think that it is better to have more cells in your brain – so it is better for your brain to make more cells than to get rid of cells in the brain.

But, we know that when you have more cells working to produce a behavior – your brain is working harder and using more energy.

When you are using less cells to do the same behavior, then you are using less energy.

That is why when you do some behaviors, like learning to do something new – like shooting a basketball into a hoop - the brain starts out using more cells to do this behavior when you are first learning. When you get really good at putting the basketball in the hoop, then you are actually using less cells. This makes your brain more energy efficient and it makes your ball go in the hoop more ---- Practice makes perfect and makes your brain more efficient!!!

SLIDE #15 – HOW CELLS WORK

In some cases, a brain change will mean that the way the cells in the brain work is changed.

Neurons are constantly talking to other cells – other neurons, glial cells, muscle cells, organ cells. (I like to say that neurons are very social creatures because they love to communicate with other cells. In fact, neurons have to communicate with other cells or else they die.)

There are lots of ways the communication between cells in the brain changes.

SLIDE #16 – BLOOD SUPPLY

In some cases, a brain change will mean that the blood supply to different brain areas is changed.

The brain needs blood to survive and to help you do everything that you do. The brain gets oxygen, energy and other chemical signals from the rest of the body through the blood.

The brain and the heart do a lot of talking and your brain directs the blood flow traffic.

When the brain needs to work harder – like when you are thinking – the blood supply to the part of the brain increases – so more blood is sent to that area.

Changes in your brain – either opening or closing blood vessels or even making or eliminating blood vessels – take place all the time.

Remember, when you are learning something – your brain is working harder – so you need more blood. When you have learned something – then your brain works more efficiently, and you need less blood.

So, when your brain changes the blood supply to different parts of your brain is also changing.

SLIDE #17 – BRAIN AND BEHAVIOR

Your brain is designed to help you adapt and survive in a world that is always changing.

We know that the brain controls behaviors and we also know that when you do behaviors you change your brain.

This is known as neuroplasticity, which could be changing the number of cells in the brain, or changing how they work, or changing the blood flow to different brain areas, or any combination of these and more changes we don't even know about yet!

Neuroplasticity – or the brain's ability to change - is what allows us to constantly change how we behave in the world. It not only allows us to survive – but, it allows us to thrive.

Your brain's ability to change helps it to do its job and that helps to make our brain healthy.

SLIDE #18 – CONCLUSION

Thank you all for letting me talk to you about how your brain changes all the time.

I have enjoyed spending time with you today talking about the brain. I hope that you have had some fun and learned something about your brain.

REMEMBER, your brain's job is to help you do all the behaviors that you need to do to survive in the world that is constantly changing. To do its job, the brain has to constantly change. When your brain is doing its job, both your body and your brain stay healthy which is SPECTacular.

THANK YOU SO MUCH FOR ALL OF YOUR HELP!!! Brain Health is not just SPECTacular...it is FUN!!!