HOW WE READ

A GRAPHIC GUIDE TO LITERACY
Every week, on the day between Sunday and Monday, bunnies celebrate Sunday. It is the eighth day in the bunny week, and for many, the most popular. On Sunday, bunnies play their favorite games in the meadow, read their favorite bunny books, and eat their favorite bunny snacks. They are the only known creatures on earth to have an eight day week, and take great pride in it. However,
Every time you read a word, you first have to recognize each letter on its own.

uh... hey, guys

nom nom

yo

hi! hey

Then you have to know what sound each letter stands for.

BUH- Uhh- NN- eee!

This is harder than it looks...

...because each letter can stand for a different sound...

...depending on which letters it's placed next to.
And that's only the beginning.

Next you have to combine each letter to form a word.

Sounds good but what does it all mean?

To answer that, we're going to have to go on a journey.

Everyone stay together or we will lose our meaning!
Here we are!

Is that a brain?

Welcome!

It looks like a brain.

I wish it looked like pizza.

All letters line up and let me get a good look at you.

Well done, everyone!

Now what happens?

You'll see soon enough.

The letters became a bunny!

That's amazing!

Yeah, I'm pretty cool.

And guess what?

ALL of our brains can do that!

But my brain wasn't doing it.

Is my brain not working? How should it be working!!?
Hey, there's no need to panic.

Brains need to work to read.

It's quite complex!

Reading didn't come naturally to me, either.

No, it didn't.

But reading doesn't come naturally to anyone.

Wait... What?!

What do you mean?

I'll explain.

Let's go back in time...
Humans aren't born wired to read...

NO! Don't eat that!

Hey! It's me as a baby!

...they're born wired to talk.

Here. Eat this instead

Can you say 'berries'?

Babies learn how to talk because their brains act like sponges that absorb all the words spoken around them.

thanks
hello!
listen
we're running late
Aw, she's so cute!
yes
tell me again
Sorry!
but...

OK
I don't know

Did you get more eggs?

Are you sure?

What?!
please?

And after some time... and practice... they can speak fluently.

bewies!

Me want bewwies!

After dinner, honey.

Can we have berries for dessert?

Sure!
huh!

Talking really did come naturally to me.

So why doesn’t READING?!

To answer that, I’m gonna have to show you...

how a brain READS

When you read, there are many different parts of your brain working together at once.

You can enter round back.

And all those parts must communicate with each other.

Let’s take a tour!
The Visual Cortex
In the back of your brain, these folks identify the letters you see.

hmm...

Looks like a backwards d
or maybe an upside-down p

that means...
it must be...

a b!

The Auditory Cortex
In the left side of your brain, this dude tells apart the sounds in words.

buh ree toh!

oooh! I dig this one! Catchy!

burrito?
correct
The Angular Gyrus

Now we're in the deep center brain, where the angular gyrus acts like a smartphone, connecting the words you see...

I'll text it

...to the sounds they represent.

bay-gull

ooh, a new one!

...but what does it mean?

Inferior Frontal Cortex

That's where the front of your brain comes in.

It collects all the information the rest of your brain has gathered...

...and as if by magic,

gives the word a meaning.
ALL TOGETHER NOW!

When you read, all these different parts of your brain work together—at lightning speed.

back of your brain

Visual Cortex
recognizing letters

Auditory Cortex
identifies sounds

Angular Gyrus
connects letters & words to their sounds

Inferior Frontal Cortex
finds meaning

front of your brain

That’s a pretty complicated process!
It’s also a relatively new one. And it all began with...

**The invention of writing**

Humans have been talking for about 200,000 years.

But they only started reading about 5,400 years ago, in Ancient Sumer.

The Sumerians invented a writing system to record information.

Scribes drew simple pictures on clay tablets using a pointed tool.

I'll have 1 bushel of barley, please.

For hundreds of years, the signs represented objects but over time, they began to change in form and in how they were used.

_**Barley, c. 3100 BC**_

<table>
<thead>
<tr>
<th>Barley, c. 2400 BC</th>
<th>Barley, c. 600 BC</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Barley Image]</td>
<td>![Barley Image]</td>
</tr>
</tbody>
</table>

In late Sumer, the barley sign could still represent barley... ...but it could also represent a sound*, like a letter in an alphabet.

*the barley sign sounded like “she”
In addition to Sumer, writing systems—and by extension the ability to read—developed independently in at least 3 other ancient civilizations:

<table>
<thead>
<tr>
<th>Ancient Egypt</th>
<th>China</th>
<th>Mesoamerica</th>
</tr>
</thead>
<tbody>
<tr>
<td>e. 3250 BCE</td>
<td>c. 1200 BCE</td>
<td>500 BCE</td>
</tr>
</tbody>
</table>

But even as reading and writing developed all over the globe, for most of human history, literacy was a skill reserved for the people in power, and those working for them.

An Egyptian scribe, recording royal affairs. 3200 B.C.

An Roman merchant, documenting trade at a port. 117 A.D.

An Islamic scholar, writing a scientific manuscript. 1062 A.D.

**FUN FACT** Today, silent reading is the norm, but most of humanity's first readers read out loud!

blah blah blah

1276 A.D.

QUIET!
The Spread of Literacy

It wasn't until the Industrial Revolution in the mid 18th - mid 19th centuries that literacy began to spread rapidly in Europe and the U.S.

Factories needed workers who could read instructions, so literacy became a job requirement.

The population boomed. More schools opened, and more children learned how to read.

The wider availability of paper in the 1800s lead to a massive expansion of newspapers, books, and pamphlets...

...which empowered people to spread and share new ideas...

...and to better understand and change their world.

Today, 86% of the global population can read.
And for good reason! There are many benefits to learning how to read.

**Reading can...**

*Strengthen your brain*

This is hard!

*But hard work...*

*... makes me stronger!*

*Build vocabulary*

... crepuscular

Sounds cool, but what does it mean?

"Of, relating to, or resembling twilight."

Cool!

*Expand your mind*

I want to learn all about the ocean.

Me too

*Reduce stress*

I'm overwhelmed

Maybe this fantasy novel will empower me.

Soon:
**improve focus**
- My brain won't stop buzzing
- I need quiet!
- Scroll, scroll, scroll

**improve writing**
- I wish I could write a story like this
- How should I start?
- Oh! I know...
- Once upon a time
- I can't stop! I need to know how it ends!

**increase empathy**
- Books are windows
- They let me see the world... through other people

**increase engagement**
- I have to do something!!
- News: Wildfires everywhere
- Save the planet
- I love Earth
- Believe in science
Wow, reading is like a superpower!
and it's one you can learn in school.

These days, most children in the U.S. start learning to read in kindergarten.

Some pick it up quickly, and others learn at a slower pace.

Hey kindergarten me!

Am I stupid?

No! And the faster readers are not smarter than you!

All children learn at different paces.

But all children learn how to read in the same way.
The 5 KEYS to Learning How to Read

1. Phonemic Awareness
Phonemes are the individual sounds that make up a word.

2. Phonics
Next we connect the sounds in words... to written letters. This skill is called phonics.

3. Vocabulary
The more words you can read, the more words you'll learn!

4. Fluency
And the more words you learn, the easier it is to read them.

5. Comprehension
And the easier reading gets, the more immersed you'll be in what you're reading...

expanding your mind!
Easier said than done!
I struggle with all those things.

Well, you're not alone. Many kids—and adults—have trouble reading.

Why it can be a struggle to learn

I have trouble recognizing sounds in words.

How many sounds are in the word “burger”?

Uh, I’m not sure!

I should know this...

I need help sounding out written words.

dark
b-ah-r-k?

bark!

No, that can’t be right...
I'm new to books and magazines, and they kind of confuse me.

English isn't my first language.

Hablo español!

I have dyslexia.

It's a very common reading disorder.

I just... don't really connect with the stuff we read in school.

So I give up sometimes. Why?

Cuz it's unrelatable.

Every book I'm assigned is written by old white dudes.

I want to read stories I can see myself in.
Unfortunately, many schools teach reading in ways that don’t support all their students. In fact, some schools teach reading the wrong way, which often looks something like this:

1. Start with ABC’s
2. Then jump right into spelling words
3. And memorizing their meanings

What does this say?
HORSE

... Here’s a clue.

This isn’t reading. Uh, a pony?

It’s guessing. close!

And a bad habit that’s hard to break.
Thankfully, science has shown us the right ways to teach reading, and it looks something like this...

**Best Practices for Learning to Read**

1. **Build Phonemic Awareness**
   - That’s just a fancy way of saying...
   - ...get to know every sound in a word!
   - Don’t be shy! Say ‘em out loud!

2. **Focus on Phonics!**
   - In other words, practice recognizing letters in words
   - ...and connecting them to their sounds!
   - Ding!

3. **Befriend Books!**
   - Hello! Most books don’t wave
   - You can read me this way!
   - to read what comes next, turn the page!
   - stern
   - front cover
   - left
   - more words
   - more words
   - right
   - more words
   - more words
   - he he!
   - Hey that tickles!
It's also helpful if you have access to...

<table>
<thead>
<tr>
<th>Trained ESL teachers</th>
<th>A culturally-inclusive learning environment</th>
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</table>

*English as a second language*

Books you want to read  So you want to read for fun!

Hey, the library has some cool stuff. Maybe I'll check out this one...

For the last time, come down for dinner!

Just one more page!!!

because when it comes to learning how to read, the most IMPORTANT THING you can do is...

READ!

READ!

READ!
And with enough practice, you'll become a fluent reader!

Cool! But... what does 'fluent' mean?

Good question.

A fluent reader is familiar enough with the connections between words, their sounds, and their meanings, that they can read effortlessly.

BUT to become fluent, you need to master slowly sounding out written words. There's no shortcut.
Ok, I'll work on my phonemes and all those other big words...

but in the end...

I'd rather just read comic books

GREAT!

Comics can help!

Think about it... Letters are pictures of sounds

And comics are pictures you read.
Comics use the same parts of your brain needed for reading text...

... and applies them to reading pictures.

Like you've been doing this whole time!

And while reading comics can't replace solid reading instruction...

... comics can make reading more fun.

Why?

Because it's easier to get immersed in a comic.

And as the Brazilian philosopher Paolo Friere once said...

... before we learn to read words.

We learn to read the world...
Learning to read is like building a web...

making connections

between different parts of your brain

So that you can connect with the rest of the world.
AND REMEMBER:
Many smart people struggle to learn how to read...
because the ability to read has nothing to do with how smart you are.
But can reading make you smarter?

YES!

It can expand your mind.

It take you to new places

And help you navigate a chaotic world.

Alright, maybe the struggle is worth it.

How do spiders learn how to talk?

...I'll save that answer for another comic!

I have one more question.

Sure.
The concept of a student-centered guide to the reading brain was the brainchild of David Liben. Meredith Liben brought the idea into being by linking key people together. This project would not exist without them. Special thanks to Amy Briggs and Celeste Hogan of Student Achievement Partners for their support. James Sturm was the editor and Dan Nott provided additional editorial input. How We Read, A Graphic Guide to Literacy exists because of a partnership and rights sharing between the Center for Cartoon Studies and Student Achievement Partners. We trust it will be of value to many students, parents, and teachers.

The Center for Cartoon Studies teaches people how to make comics to help us better understand ourselves, our community, and our world.

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Thank you for reading
If you can read this sentence, something amazing is happening in your brain.

How do we learn how to sound out written words? How was writing even invented? What are the benefits of reading? Why is it so hard to learn?

How We Read: A Graphic Guide to Literacy answers these questions and more. Whether you are learning how to read or helping someone who is, this comic will help.

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