

Ancestral Voices

Calling - calling 'cross the centuries
Listening - listening to the voices
Of our long-gone ancestors whispering across the years
Across the years
Painting - painting beasts on cave walls
Blowing - blowing paint round splayed hands
And our long-gone ancestors telling tales
Across millennia
Across the years - across the years - the years

From the ancient of days to the smile you just gave
What makes us special, say
What makes us humans special, if we are?
And surely, how can we say
We're the "wise apes" - *Homo sapiens*
If not because we can read those thoughts from long ago
And leave our own thoughts as a legacy for the future?

We stand on the shoulders of giants
We stand on the shore of an ocean of gold
Brimful of the learning and the wisdom of our forebears
But just a drop in that vast ocean
Of what remains to be known - to be known

From the ancient of days to the smile you just gave
What makes us special, say
What makes us humans special, if we are?
And surely, how can we say
We're the "wise apes" - *Homo sapiens*
If not because we can read those thoughts from long ago
And leave our own thoughts as a legacy for the future - the future - for the future?

The Reflex Trick

VERSE 1

Scrub, scrub, scrub in a nice warm shower
Down drops a spider and I scream and cower
It scuttles and it scurries, closer inch by inch
Without a single thought I recoil and flinch
Without a single thought I recoil and I flinch

The sight of the spider is the stimulus that kicks
My eye is the receptor that trips the reflex trick
Sensory neurons take impulses to my head
Electrical and chemical communicating dread
Neurons are electrical, synapses gaps
Which chemically transmit the message just like that
The central nervous system sends signals in reverse
Motor neurons spark effectors, thoughts are second, actions first

REFRAIN

Oh, oh - the reflex arc
Before you know it, you jump, jerk and jar
Oh, oh - and this arc stars
A neurobiological electrical spark *[repeat refrain]*

VERSE 2

Dig, dig, dig on a late summer's day
Take a sip of punch, swat that pesky wasp away
In angry retribution, stings me on the cheek
Without a moment's hesitation, I flick it and shriek
Without a moment's hesitation, I flick it and I shriek

The sting of the insect is the stimulus that kicks
My skin is the receptor that trips the reflex trick
Sensory neurons take impulses to my back
Electrical and chemical communicating attack
Neurons are electrical, synapses gaps
Which chemically transmit the message just like that
The central nervous system sends signals in reverse
Motor neurons spark effectors, thoughts are second, actions first

REFRAIN

Oh, oh - the reflex arc
Before you know it, you jump, jerk and jar
Oh, oh - and this arc stars
A neurobiological electrical spark *[repeat refrain]*

Animal Chat

[The Animal Communication Song]

Animals communicate with sound
Elephants stomp
On the ground
Meerkat calls are simple words
Rattlesnakes rattle tail beads, I've heard
Rattlesnakes rattle tail beads, I've heard

REFRAIN 1

Higher sounds every creature
Makes when they're glad to meet 'cha
when in need or pain or flight and
Lower sounds to fight or frighten.
Could it be men have more success if
Their low voice makes them seem aggressive.

Animals communicate with sight
Cuttlefish ripple their thoughts in light
Bees go waggle saying "food's over there"
Hoverflies tell lies, disguised with stripes in the air
Hoverflies tell lies, disguised with stripes in the air

REFRAIN 2

Stomp, vibrate, singing, sonar
Sniff that stink - smells waft so far
Look, dance, flap, display and ripple
Feel, groom stroke, brush
Swipe and wiggle
Animals share their information
Using different communication

Animals communicate with touch
Doggie licks say "I love you very much!"
Monkeys groom, eat each other's tasty fleas
[Alto/Bass sing "Monkeys groom, luscious lice, crunchy nits, tasty fleas, lovely fleas"]
Pussycats say "feed me" by clawing at your knees
Pussycats say "feed me" by clawing at your knees

REFRAIN 3

Vomer nasal organ
in the nose of a dog and
other mammals, snakes and fish who
have a pit and special tissue
able to sense the pheromones whose
presence carries the latest dog news.

Animals communicate with smell
Pheromones attract, inform and repel
Secreted in glands and in dung and in pee
To mark a territory, say "go away!" or "come and find me!"
To mark a territory, say "go away!" or "come and find me!"

REFRAIN 4

As they walk canine migrants
Pee on walls, trees and hydrants
Each declaring that his right is
To be there and what his height is
Animals share their information
Using different communication

CODA

Sop/Ten	Sound, sight, touch, smell, sound, sight, touch, smell
Alto/Bass	Hearing and seeing and feeling and sniffing Hearing and seeing and feeling and sniffing
All	Sound, sight, touch, smell, sound, sight, touch, smell - communicate!

By students at Gatehouse Primary School, Dawlish working with David Haines December 2010

Barks, Growls, Whimpers and Howls

By Lauren Mayer

Men:

A dog is a terrific pet
Affectionate and true
But while you're playing, don't forget
He's saying something to you
With barks, growls, whimpers and howls
He gets his message through.

If you're ever curious
About what dogs might say
They do communicate with us
In a brainy canine way
With barks, growls, whimpers and howls
You hear 'em every day.

Kids:

You can translate what your pup
Is saying in each case
When he pants or sniffs or scampers up
Or when he licks your face

His wagging tail says "let's go"
When you start off on a walk
A zippy yip can let you know
Someone's coming up the block
Barks, growls, whimpers and howls
Are how a dog can talk!

Body language, face and eyes
Can make his feelings clear.
A dog will even put you wise
By raising up one ear

So when new dogs are meeting you
Let them come sniff your hand
When your dog's happily greeting you
He helps you understand

All:

His barks, growls, whimpers and howls
Are the tools at his command
He barks, growls, whimpers and howls
(Kids) Arf, arf , ahooo
Barks, growls, whimpers and howls
Barks, growls, whimpers and howls
He gets the message through! Yeah!

Honeybee

In weather that's sunny, a bee will make honey
From flowers that bloom in the field.
She goes to collect her supply of the nectar
As much as the blossom will yield.
But when it's so sweet or there's so much to eat
She decides it deserves her endorsements,
It's time to contrive to return to the hive
And to strive to bring back reinforcements.

And when that exploration leads to the evaluation
That the present situation calls for their cooperation,
They must share the information that enables navigation
To that promising location that deserves revisitation
And so what is the foundation for the bees' communication?
They dance.

A bee travels forward while shaking her booty
In part of the dance known as the waggle run.
The angle she moves at -- and this is the beauty --
Is that of the food with respect to the sun.
The length of the waggle's the length of the route, e-
Ven if it's eight miles till the bounty is won.
The bee circles round to return to her duty
And waggles again till her message is done.
The odor she bears, whether floral or fruity,
May be one more part of the story she's spun.
And that is the language with which bees recruit; e-
Thologically speaking, they're second to none.

The Language Ladder

VERSE 1

Why.....?
Why is the baby crying?
Why, oh, why?
Maybe he's hungry
Give him milk, give that a try - shh... - waaah!!
Baby is still sobbing
What shall we do?
Maybe his diaper is full of squishy poo - bleugh!
Baby's still screaming
I'm getting really stuck
Pat him on the back and burp him - *[belch - sigh]*
What a stroke of luck!

REFRAIN 1

He's poised beside the language ladder
Waiting to ascend
He's poised beside the language ladder
This babe's communication drives me round the bend *[repeat refrain]*

VERSE 2

What....?
What is the baby saying?
What, what, what?
Baby is a rapping, babbling, scattin, chatting tot
Copying our sound patterns
Experiments with his voice
Playing with syllables
Without a conscious choice
When he says "mama mama mama mama mama mama mama mama " "
His mama jumps for joy
"He just said his first word - 'Mama'
My little man, my little boy!"

REFRAIN 2

He's poised beside the language ladder
Waiting to ascend
He's poised beside the language ladder
This babe will climb the language ladder in the end *[repeat refrain]*

VERSE 3

When....?
When will he say a sentence?
When, when, when?
His vocabulary's growing
"Cat", "Dad", "dog", "poo", "hen"
Even knows some phrases - "big dog", "little puddy cat"
Sometimes he makes some sense
Sometimes random chat
Soon the tables will be turned
Then it will be I
Answering his endless cries of
"Why, why, why, why, why, why, why, why, why, why, why, why, why?!"

REFRAIN 3

He's poised beside the language ladder

Waiting to ascend

He's poised beside the language ladder

This babe will climb the language ladder in the end *[repeat refrain]*

This babe will climb the language ladder in the end

by students at Bishopsteignton Primary School, Devon working with David Haines 9th/15th December 2010
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Six Dots

INTRO

One two three four five six dots within a cell *[repeated several times]*
Thanks to Mister Braille

VERSE 1

In eighteen-twelve at the age of three
Little Louis Braille could no longer see
Sent away to school to learn to read and write
But there were only raised letters for kids with no sight

VERSE 2

Louis found a code used by soldiers in the dark
Phonetic dots and dashes raised to make a mark
"Good, but inefficient", thought the fifteen-year young man
I'll keep the dots and ditch the dashes - improve it if I can - improve it if I can

REFRAIN

One, two, three, four, five, six dots within a cell
One, two, three dots vertically start Louis's name with "L"
Take away the bottom dot, gives letter "B" for "Braille"
He died unknown but, famous now, Louis Braille we hail!

BRIDGE

One two three four five six dots within a cell
One two three four five six dots within a cell
Thanks to Mister Braille

VERSE 3

Nearly every language uses Braille even now
You can read it, you can write it and your fingers show you how
You can read beneath the covers without light
Keeping warm and cozy on a cold and wintry night - on a cold and wintry night

REFRAIN *[twice]*

One, two, three, four, five, six dots within a cell *[etc]*

By members of Teignmouth Community Choir
working with David Haines December 2010
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Dots and Dashes

[The Telegraphy Song]

Dash, dot dash, dot dash dot dot, dash dot dash - "talk" "talk" *[repeat]*

A long time ago and far, far away
Plenty of people had something to say
To relatives and friends across the sea
Or even within the same country
But homing pigeons that flew so fast
Or letters that travelled by horse and by cart
Took hours or days or weeks on end
As slow as a slug they took to send - to send

REFRAIN

Telegraphy made it quick to communicate bit by bit
Cables in ocean blue transporting news from me to you
Dash, dot dash, dot dash dot dot, dash dot dash - "talk"
Dash, dot dash, dot dash dot dot, dash dot dash - "talk" "talk" "talk" "talk"
Dash, dot dash, dot dash dot dot, dash dot dash - "talk" "talk"

In 1837 Sam Morse in the USA
And Wheatstone and Croft in the rainy UK
All made a breakthrough in telegraphy
Discovered it simultaneously
The cable reached France in 1850
And the US of A in the 1860s
In 1870 India was reached
The cable began at Porthcurno beach - Porthcurno beach

REFRAIN

Telegraphy made it quick to communicate bit by bit
Cables in ocean blue transporting news from me to you
Dash, dot dash, dot dash dot dot, dash dot dash - "talk"
Dash, dot dash, dot dash dot dot, dash dot dash - "talk" "talk" "talk" "talk"
Dash, dot dash, dot dash dot dot, dash dot dash - "talk" "talk"

Gutta percha was the outside coat
Of those long copper cables positioned by boats
Which crossed the ocean in all kinds of weather
Joining the whole wide world together
Now fibre optics form the web
Replacing copper, now that's nearly dead
From only forty bytes in copper wire
To terabytes and ever higher - ever higher

REFRAIN

We now are transmitting more than a trillion times before
Cables in ocean blue transporting news from me to you
One, zero, zero, one, one, zero, one, "talk"
One, zero, zero, one, one, zero, one, "talk", "talk", "talk", "talk", "talk"

A Parapsychological Pledge

By John Howell Morrison
Lyrics by Abner Shimony

Can we communicate with the dead? Some people think so, and study ways to interpret strange sounds as evidence of what they call "Psi", the domain of parapsychological phenomena. But there are also psychologists who study these people. After all, if the dead can communicate with us, why don't they just talk?

If a spirit meet a spirit
Wandering on the edge of Psi
Should a spirit greet a spirit
With a rattle or a sigh?

Elysium receives its guests to
Hear the sages teach.
Could Socrates among the dead
Have suffered loss of speech?

Are souls so thin of substance
Or so bound by etiquette
That Sappho could not whisper
An impassioned epithet?

Music rules the planets
And the elementary fire.
Are human voices silent
In the universal choir?

If you and I should chance to meet
Upon an outer shore of Psi,
We'll pledge a finer discourse
Than a rattle or a sigh.

Beauty and a Brain

By Lauren Mayer

Chorus:

*Hedy Lamarr, the famous movie star
Did more than entertain
Smart and scientific,
Her inventions were terrific,
She had beauty AND a brain!*

Her life was more exciting than any movie plot
To start, she was smarter than anybody thought
Born in Vienna to a family of means
Became a famous actress while still in her teens
Wed a weapons magnate, a much older man,
He made her come to meetings that were part of the Nazi plan
He watched her every movement, she grew more afraid
'Til she finally escaped him, disguised as her maid.

Chorus:

She made her way to London, and then to Hollywood
Became a major actress, her movies were quite good
But with Hitler in Europe, oh what could she do
No formal science training, but she knew what she knew
Radio waves are intercepted with ease
But people, when they talk, are always changing frequencies
So frequency hopping was the remedy
And she invented spread spectrum technology.

Chorus:

Received a patent, now that's hard to get
But the Army just wasn't ready yet
So though her idea was truly sublime
She was twenty years ahead of her time!
They told her, selling war bonds was what she could do
But finally the industry caught up in 'sixty-two
Different systems developed from it, by and by
Without Hedy's invention we might not have wifi!

Chorus:

*Hedy Lamarr, the famous movie star
Did more than entertain
Smart and scientific,
Her inventions were terrific,
She had beauty AND a brain! (3x)*

Only Connect

[The song of the Internet and World Wide Web]

INTRO

Internet is so cool, internet is fine and dandy *[repeated many times]*

VERSE 1

The Internet's cool, the Internet's fine
Ain't been around for that long a time
The Internet's cool, the Internet's fine
Ain't been around for that long a time
In the nineteen-sixties it all began
J C R Licklider was behind the plan
Had the idea of making a network
To link up computers
Was he berserk?
Absolutely not! *[spoken]*

REFRAIN 1

Because the Internet's great
You can chat to your mate
Email, gossip, communicate
And now the Internet's great
A way to escape
Research, learn, play, educate

Internet is so cool, internet is fine and dandy *[repeated many times]*

VERSE 2

Tim Berners Lee was working at CERN
Developed the Worldwide Web to turn
The Internet into an accessible tool
Open to humanity for one and all
In 1991 he wrote protocols
HTTP and URL to further his goals
The internet's the infrastructure, network of nets
The web is one of its services that interconnect
Two different things! *[spoken]*

REFRAIN 2

And now the Internet's great
You can chat to your mate
Email, gossip, communicate
And now the Internet's great
A way to escape
Research, learn, play, educate

CODA

Check out the weather, get your mail by SMTP
How's the traffic? How busy will my journey home be?

Here's a message from my Granny on a cruise in the Med
I'll chat with her on my smart phone while lying in bed
Watch a video of my baby cousin over the sea
Catch the telly programme that I missed on the TV
Listen to music, buy a book, store my photos online
Work from home, save the fuel, save the travelling time
I love the World Wide Web
Adore the Internet
Like everything else it ain't perfect
But E M Forster said it long ago - "Only connect"

By students at Shaldon Primary School working with David Haines December 2010

Satellites

Flying high in the sky - satellite flying high *[repeated several times]*

VERSE 1

They guide me there and back again
By transmitting time and name
My sat nav picks up signals quickly
Reads the different times to reach me
Three satellites are all I need
For my coordinates to read...

REFRAIN

Satellites flying high
Orbiting in the sky
Satellites looking down
Sending signals all around

Flying high in the sky - satellite flying high *[repeated several times]*

VERSE 2

Snow, wind, hail, frost, ice, cloud and rain
Volcanic ash and hurricane
Cameras, sensors scan the Earth
Weather and climate they observe
Weather's local, just right here
Climate's global, year to year

REFRAIN

Satellites flying high
Orbiting in the sky
Satellites looking down
Sending signals all around

Flying high in the sky - satellite flying high *[repeated several times]*

VERSE 3

Before you switch your TV on
Think where that signal's coming from
Electromagnetic waves
From ground transmitters into space
Bounce down from there into your dish
From twenty thousand miles-ish
From twenty thousand miles

REFRAIN

Satellites flying high
Orbiting in the sky
Satellites looking down
Sending signals all around *[repeat whole refrain]*

A Tower in Space

By Bruce Lazarus

Launched into orbit in July of 1962
Only four years since the first man-made satellite flew
Beach-ball with an antenna and solar cells for power
Created by Bell Labs, launched by NASA like an orbiting tower

Telstar was the first active communications satellite
Transmitting TV, phone calls, and radio
Beaming through space point to point
many times of day and night

Telstar ushered in a new era of satellite communication
Also a good effort, a beginning to global peace and friendship

A tower in space! Telstar Telstar

Le premier liaison de television par satellite

A tower in space! Telstar Telstar
President John F. Kennedy (shouted)

Was relayed by Telstar across the ocean
Carrying message from both sides of the world
Essential for peace, peace, a requirement for peace!

Peace, peace an essential requirement of peace

Six months after launching it was over
Its delicate transistors failed, what a shame
But Telstar had a lot of successors
Now we have cell phones and Telstar is a memory
But Telstar will remain in orbit for at least another century

Telstar was the first active communications satellite
Transmitting TV, phone calls, and radio
Beaming through space point to point
many times of day and night
A tower in the sky launched by NASA in '62

Speedier communication here and across the ocean
A tower in space! Telstar Telstar Telstar

Exoplanet Explorer

For Sara Seager

Out there in space there's a planet like Earth
On a galactic scale not so very far
Watery, rocky, not too big, nor too small
Nor too far from, nor too near
To its star

We are explorers exploring new worlds
Orbiting stars far beyond our own
Soon we shall find a planet like Earth
But will it prove to be home
To life?

How do we see these pin points in the sky?
Far harder than finding a needle hidden in hay
Electronic senses and digital intelligence
Enhance our chance to see far, far away

Radial Velocity spots change in star's speed
In its dance with its planets – Doppler Shift we see
Transit Technique seeks slight changes in light
When planets pass star it becomes a little less bright...

With Direct Imaging snap planets around
Stars by blocking starlight so planets are found
Gravitational Microlensing, Astrometry
Two more ways these exoplanets may be seen

Out there in space there's a planet like Earth
On a galactic scale not so very far
Watery, rocky, not too big, nor too small
Nor too far from, nor too near
To its star...

Streetfighting Math

For Sanjoy Mahajan

Why do they teach you to be scared of math?
Tell me why, why do they do that?
When you were learning mathematics at school
I bet they taught you math was a precision tool

*That ain't right - they led you astray
More or less is good enough nearly every day
That ain't right - nine times out of ten
An approximation moves you forward and then...*

If you need a figure to be quite exact
Do the calculations for the exact fact
But if you have guesstimated first
You'll know if your answer's right, or trash or worse

Rigor leads to *rigor mortis* – don't just stand there
Divide and conquer, don't just stand and stare
Remember these six streetfighting math tools
Remember too that these are tools, not rules

*Don't get stuck like a deer in headlights
Don't give up the battle, grab your math tools and fight
You can win, and it won't take you long
Better to be nearly right than exactly wrong*

[1] Check your dimensions, don't add apples to pears
Don't try subtracting anacondas from chairs
[2] Correct solutions work for easy cases too
Test them first on simple - if they work, they'll do

[3] If calculus defeats you, box your way out
Lumping lets you live to fight another bout
[4] Images tap the power of the human mind
If possible let pictures oust symbols and signs

[5] Identify the big part in a calculation
Solve the main bit first, you may well find you're done
[6] When you're stuck, create a simple analogy
Solve that first, the harder one becomes easy

*They ain't right when they say math is hard
Learn these simple six tricks of the trade for a start
You ain't right, thinking you need to be a Prof
Learn these nifty moves and fight that math problem off*

*Don't get stuck like a deer in headlights
Don't give up the battle, grab your math tools and fight
You can win, and it won't take you long
Better to be nearly right than exactly wrong
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