2021 Vision: I See What You Did There

SONG NAME (mostly alphabetical) **SONG NUMBER**

1. *All About Tears* by Molly Ruggles.....SONG 01
2. *All About the Senses* by Daniel Kallman and Christine Kallman.....SONG 02
3. *Cambridge Public School Medley* by David Haines.....SONG 03
4. *Cataracts* by David Haines.....SONG 04
5. *The Dizzy Song* by Bruce Lazarus.....SONG 05
6. *Evolutionary Eye* by David Haines and Rachael Shearmur.....SONG 06
7. *Four Eyes* by Stanley Sagov and David Bass.....SONG 07
8. *In the Faraway Near of the Hidden Ear* by Daniel and Christine Kallman.....SONG 08
9. *Invisible Colors* by Andrea Gaudette.....SONG 09
10. *The Nose Knows* by Lauren Mayer.....SONG 10
11. *The Octopus Song* by Graham Treacher.....SONG 11
12. *Optical Illusions* by David Haines.....SONG 12
13. *Perfect Pitch* by Tim Maurice.....SONG 13
14. *The Power of How We Feel* by Lauren Mayer.....SONG 14
15. *ROY G BIV* by Bruce Lazarus.....SONG 15
16. *Single Photon* by David Haines.....SONG 16
17. *Six Dots* by David Haines.....SONG 17
18. *Tinnitus* by David Bass.....SONG 18
19. *That's How Things Are Seen* by Bruce Lazarus.....SONG 19
20. *Topsy-Turvy Vision* by Ruth Hertzman-Miller and Meg Muckenhoupt.....SONG 20
21. *Virus, COVID Edition* by David Haines.....SONG 21
22. *What Do You See, Butterfly?* by Michael Ching and Jennifer L. Knox.....SONG 22
23. *A World of Sound* by Bruce Lazarus.....SONG 23

ACCESSING THE PRACTICE TRACKS:

1. Go to www.familyopera.org
2. On the left, under User Login, enter
   Username: ncfo-chorus
   Password: VI-2020
3. Above left, under Content Menu, click on "2020 Vision Performer Materials"
4. Click on "PRACTICE MP3s and LYRICS/SHEET MUSIC"

SONG 1. ALL ABOUT TEARS
by Molly Ruggles

When you laugh or sneeze or yawn or cry,
You might be feeling tears in your eye.
When smoke's in the air or wind's in the sky,
Tears will be flowing blinding your eye.
What makes them run and where do they go?
Why do they flow? Do you want to know?

Here are some basics to help us begin.
Biochemically tears are sim'lar to
Saliva, like the water in your mouth.
And additionally tears have fatty oils and
Proteins that you cannot live without.

Electrolytes hormones, lipids and salts
Keep your eyes safe and protected.
They also prevent your eyes from ever getting
Dry, sore, or infected.

Fascinatingly there are actually
Three kinds of different tears your eyes produce.
Each has a very special purpose a certain
Function and a physiologic use.

Continuous or basal tears are always in your eyes,
Lubricating, adding moisture and protecting.
Reflex tears are caused by irritants like smoke,
Like onions or wind or anything that's threatening.

Third and finally if we have a strong emotion,
We will cry because we're sad.
Psychogenic tears like this occur when we're
Excited, or also passionate or mad.

So now you know some more about your fabulous eye.
You know about the three different kinds of tears.
You also know the reasons why a person will cry.
So keep this information between your ears.
Now that you're equipped with some facts on tears!
Hmmm...

SONG 2. ALL ABOUT THE SENSES
by Daniel and Christine Kallman

SONG 3. CAMBRIDGE PUBLIC SCHOOL MEDLEY
by Cambridge Public School Students, facilitated, tweaked, and arranged by David Haines

SONG 1: ANIMAL CAMOUFLAGE
I am searching for my friend,
Orchid mantis Lil.
Is it you or a flower
Or my other pal, Bill?
Hymenopus coronatus
You're pretty, white and pink
But when a fly comes hovering by
You'll catch it in just a blink.

How do camouflaged creatures spot
Their family or friends when they're clearly not
Visible to anybody else around?
When they merge into the background,
How can they be found?
When they merge into the background,
How can they be found?

I am searching for my Mom:
Big white polar bear.
Is that an igloo or iceberg
Or my Mom over there?
I tumble, chase and play
With my sibling every day
But in the ice and snow we know
She's there for both of us always.

How do incognito beasties see
Other members, in disguise, of the same species?
We humans look, snoop, scrutinize, spy, pry and peer,
But those cunning, crafty creatures simply disappear,
But those cunning, crafty creatures simply disappear.

I am searching for a snack
Eight tentacles, nutritious.
Is that some coral or a rock,
Or octopus? Delicious!
Elusive cephalopod
With chromatophoric skin
It's there! It's not! It's weird, it's odd
Mimics what it's on or in!

How do camouflaged creatures spot
Their family or friends when they're clearly not
Visible to anybody else around?
When they merge into the background
How can they be found?
When they merge into the background
How can they be found?

SONG 2: HOWLER MONKEY SENSES
I am a howler monkey, swing, swinging through the trees.
I feel soft, squishy moss and wet, slippy, shiny leaves.
I pick a plump plantain, tastes so good and sweet.
I hear monkeys chatter, chattering, birds going tweet,
twiddly tweet.
Smell perfumed flowers, choc'laty cocoa beans,
Howl at the furriest tarantula I've seen!

With his pneumatized hyoid, my dad makes a roaring sound,
The loudest of land animals, audible three miles around.
I can smell luscious ripe fruit from more than one mile away.
With my trichromatic vision I can see more colors than I
can say.
We Alouatta monkeys in South America thrive,
Happily howling in the steamy jungle, so glad to be alive!

SONG 3: SENSES IN THE RAIN
I'm taking my umbrella for a walk in the rain,
Sound of bursting drops like firecracker: just the same!
Rain on my tongue tastes like liquid air
Raindrops splashing in puddles everywhere
Water clears the dust, air is smelling clean
To squelch through squishy squashy splishy sploshy
squidgy mud, I am very keen!

For days the sun had shone until this sudden downpour
And the air was filled with heady scent of petrichor.
Sun was nearly setting in the western sky,
In the east, glorious rainbow arching high.
Raindrops act like prisms, refracting sunlight's rays
Into red and orange, yellow, green, blue, indigo and violet.
Amazed, I watch and gaze.

SONG 4: SEARCHING FOR DELICIOUS
As your eyes see color with red, green, blue,
Your tongue tastes flavors as you chew.
Sweet, sour, bitter, salt, and umami,
Mango, lime, beer, French fries, salami.

Searching for delicious, will the science help me?
Searching for delicious, I'm drooling anticipatorily!

As you bite, chew, salivate, break food up into
Fibers and juicy, slushy, slurpy, slippy, slup!
Taste buds detect food's molecules and
These float up into nasal passage land.

Searching for delicious - it is no mystery,
Searching for delicious - it is just gustatory chemistry!

SONG 3. CAMBRIDGE PUBLIC SCHOOL MEDLEY (continued)
by Cambridge Public School Students, facilitated, tweaked, and arranged by David Haines

SONG 5: SIGNALS WITH SENSES
Ambulance siren yells “Get out of my way!”
Green, yellow, red lights: “Go, ready, stay!”
Flower scent communicates to buzzing bees
“Eat our sweet nectar, spread our pollen please!”

All five senses are used in many a way
To communicate information every day.

Ding ding on the bus, “We’re stopping here right now!”
‘Dong’ on the dinner gong, “Time for chow!”
Fingertips read Braille dots, no need to see
Smell Chanel Number Five, “I am a posh lady!”

All five senses are used in many a way
To communicate information every day.

High-five or handshake says “Hello, friend!”
Yucky taste from tongue to brain says “Don’t eat them!”
A smiling pat on the back can say “You won! Well done!”
They are all signals using five senses, one by one!

All five senses are used in many a way
To communicate information every day,
All five senses are used in many a way
To communicate information every day!

SONG 4. CATARACTS
by David Haines

My world is gradually fading away
Slowly year by year, though not day by day
Colors less vivid, trouble seeing at night
There are halos around every source of light
I used to smoke like a chimney, and I drank too much
Did not wear shades in the sun, but now I know they were such
Stupid things to do - I wish I'd realized
How badly I was damaging my precious eyes.

Is it a cataract catastrophe?
Am I doomed to one day not be able to see?
As my vision fades year by year by year,
I feel a secret growing fear.

Oooo, oooo, oooo, oooo...

The surgeon says she'll anesthetize my eye - it'll be paralyzed
Within cornea two tiny cuts she will incise
Through which a hole with a needle in the lens will be made
Ultrasound will emulsify the lens so degraded

The cataract's outer layer - cortex by name
Will be aspirated (sucked away) to achieve the aim
Of making room for a folding plastic lens to be
Inserted in the capsule to return to me…..

The kind of vision that I once enjoyed
Rich colours and clarity, no longer annoyed
By being unable to recognize faces of friends
Maybe cataracts will prove to be a blessing in the end…

I will appreciate like never before
This precious sense I thought was lost now it has been restored
I will remind myself each day how lucky I've been
To see again the way that I used to see
I'll see again with clarity - I'll see again how I used to see!
I'll see again with clarity - I'll see again how I used to see!

SONG 5. THE DIZZY SONG
by Bruce Lazarus

Without balance, walking is tricky,
Gymnastics are iffy.
It's the vestibular system which helps keep our balance.
Knowing where "down" is – that's one of its talents.
Deep in our ear it detects our position:
Angle to floor – that's its primary mission.

If you wake up and the whole room is spinning
Headaches and nausea are just the beginning.
Spinning to left or you're spinning to right,
Disorientation can be quite a fright.
The culprit might lie in your vestibular system.
Seeing a doctor – that's truly sound wisdom.

SONG 6. EVOLUTIONARY EYE
by David Haines and Rachael Shearmur

Oo...
That the eye could have evolved by natural selection
Seemed even to Darwin at first glance absurd,
But he pondered and wandered and wondered some more
And resolved that it could, whether in man beast or bird
From an optic nerve coated with pigment
Behind an eyespot of photoreceptor cells
Holding proteins called opsins which sensed ambient brightness
And the night and day rhythms of life's carousel

Our life is infused with the language of sight
We connect to the world through the dark and the light
A sight for sore eyes, an eye-catching form
The eye of a needle, the eye of a storm

The region of the eyespot evolved to be sunken
To form something resembling a pit or a cup
Giving limited directional sensitivity
So the source of the light could now be picked up
Over millennia the cup became deeper
Allowing for greatly improved resolution
Gradually enfolding a water-filled chamber
With a pinhole opening as the solution

Our life is infused with the language of sight
We connect to the world through the dark and the light
Bleary-eyed, teary-eyed, bright-eyed or wide-eyed
Eagle-eyed, starry-eyed, one-eyed or doe-eyed
Ah….the eye, the eye…

The water became a vitreous humour
Maintaining the retina at the back of the eye
Transparent cells grew to cover the opening
The protective cornea and the lens by and by
And between them an aqueous humour developed
Defined by the iris – non-transparent ring –
So allowing more blood vessels, more circulation
And far bigger eyes to let the light in

Our life is infused with the language of sight
We connect to the world through the dark and the light
An eye for a bargain, keep your eyes on the prize
With a bird's eye view feast your eyes from the skies…

SONG 7. FOUR EYES
by Stanley Sagov and David Bass

SONG 8. IN THE FARAWAY NEAR OF THE HIDDEN EAR
by Daniel Kallman and Christine Kallman

I've often wished that I could peer
Into the chambers of the ear
And travel as the soundwaves do.
I'd take you with me, too.

We'd swoop around the auricle
Into the outer ear canal,
(A bit of wax to keep things clean).
We'd only stop when we had seen
The thinly stretching tympanum
That's made to vibrate like a tiny little drum.

And then imagine we appear,
And marvel, in the middle ear,
Where busy work of tiny bones
Makes all of these vibrations grow and grow.

We see the hammer, anvil, and the stirrup—
These are the ossicles, the smallest bones we have—
Send a soft chirp, or a loud burp
From the tympanum to the oval window,
A Rube Goldberg model in flow.

If we could sail a nano boat
Within the inner ear, we'd float
And ride upon the rippling waves
Into a winding maze.

On surging seas we'd carousel
The spiral cochlea on swells
To reach the organ of Corti,
A very hairy place to be,
Where signals zoom from hairs to brain!
We know that high toot is the whistle of a train.

Then off to the semicircular canals;
I'd rock and roll with my best pals
In the faraway near
Of the hidden ear.

SONG 9. INVISIBLE COLORS
by Andrea Gaudette

Red and orange yellow green and blue and violet:
Colors in the rainbow human eyes can know.
But there are other colors we can never truly see.

Dorothy and Toto went beyond the rainbow niche,
Spun around in circles, crushed the wicked witch.
Don't you ever wish for colors just like Dorothy?

Ultraviolet lies just beyond the purple hue,
Electromagnetic radiation's shorter waves.
Longer waves are infrared light we cannot see
But we feel as heat.

High:

Sometimes how I wish that I could
See into the dark:
Colors in the spectrum
Beyond the rainbow's arc,
Colors that I cannot reach
Invisible to me.

Red and orange yellow green and
Blue and violet:
Colors in the rainbow
Human eyes can know.
But there are other colors we can
Never truly see.

Low:

Red orange yellow green blue violet
Red orange yellow green blue violet
Red orange yellow
Green blue violet
Red orange yellow
Green blue violet
Red orange yellow
Green blue violet
Red orange yellow green blue violet
Red orange yellow
Green blue violet
Red orange yellow
Green blue violet
Red orange yellow
Green blue violet
Red orange yellow green and blue

SONG 10. THE NOSE KNOWS
by Lauren Mayer

The Nose Knows
If something's strange or could mean danger
When things stink
It makes us stop and think
The Nose Knows
Sometimes smell is how we tell
The proper reaction; and that's olfaction

When volatile molecules enter our nose
They give us important information
For example, if food smells rotten, it oughta be forgotten
Except in the case of fermentation

The Nose Knows
If something's strange or could mean danger
When things stink
It makes us stop and think
The Nose Knows
Sometimes smell is how we tell
The proper reaction; and that's olfaction

Our senses can let us know what to avoid
When something unexpected has appeared
Like people who got sick or chemicals that are toxic
Though some things just smell bad because they're weird

Like certain plants in bloom, locker rooms, towels that need airing
Dirty socks, a litter box, limburger cheese
Moldy grass, passing gas, fish sauce or herring
Hold your breath if you take a whiff of any of these

Countermelody:
Methylcaproic acid or cadaverine
Indoles or ammonia or methane thiol
Sulfides, disulfides, trisulfides, trimethyl amine
Foul smells come from chemicals like these!

The Nose Knows
If something's strange or could mean danger
When things stink
It makes us stop and think
The Nose Knows
Sometimes smell is how we tell
The proper reaction; and that's olfaction
And that's olfaction, pyoo!

11. THE OCTOPUS SONG
by Graham Treacher

Verse: Deep down below, deep down below
There's something strange, there's something eerie, eerie.
The ceph'lopods, the squid and octopus,
Just like we humans blink, blink, blink, blink, blink.
We both can blink and glint and dart,
Those same old eyes, the squid and me.

Chorus: It just had to be, just had to be, to be, to be.

Verse: The octopus is not a human,
Yet its eye looks just like

High: mine, looks just like yours, the squid and me.
Low: retina and cornea and iris, lens and fluid-filled.

Chorus: Convergent evolution made our eyes appear the same.

Verse: The octopus cannot see color
But it can detect polarity of light,

High: Polarity of light.
Low: It has no blind spot in its eye because

Chorus: Its eyes grow from its skin, and our eyes grow from our brains.

Verse: Our retina, it faces backward,
In the squid it faces forward. It evolved

High: from different cells.
Low: from dermal tissue, ours evolved from nervous cells.

Chorus:
High: Convergent evolution had to be, to be, to be.
Low: Evolution had to be, to be, just had to be, just had to be, to be.

SONG 12. OPTICAL ILLUSIONS
by David Haines

When a sad old lady is a glamorous girl
A bunny is a duck, then a bunny then a duck
That glamour girl is looking into a mirror
Look again, it's a skull, you're left dumbstruck!
See a swan and squirrel - is it one? is it both?
Two faces close together - it's a vase - no, it's not!
Seven doves in flight or a man looking down?
Does the word say 'teach' or 'learn'?, I have got...

All muddled up, can't believe what I see
Discombobulated by ambiguity
Such ambiguous optical illusions depend
On my brain seeing one thing then another when I look again
[When I look again]
[Brain] seeing one thing then another when I look again
Brain seeing one thing then another when I look again, [again]

When the rising Moon looks incredibly huge
Or twins in the Ames room are hard to believe
'Cause one looks tiny and the other looks gigantically big
'Apparent Distance Hypothesis' deceived
Your brain into making a false assumption
Try viewing Holbein's 'Ambassadors' from the front
Looks like an accidental smear of paint
But viewed from below, see a skull!
'Trompe l'oeil': what an optical stunt!

I'm all befuddled, I can't trust my own eyes
Non-existent colours, patterns, things look the wrong size
Negative images which only look right
When I stare at them for ages then at something blank and white!
[When I stare]
When I stare at them for ages then at something blank and white!
Stare at them for ages then at something blank and white!

'Literal Illusions' exploit tenth-of-a-second delay
Between retinal image and processing by brain
Which tries to guess what it will see but freaks out
When prediction and the outcome are not the same
'Physiological Illusions' take advantage of
Limitations of the far-from-perfect human eye
Those ghostly dots at intersections around
The one you're focused on are not real -
My! So sly!

'Cognitive Illusions' are the disparity
Between how you know the world works and what you can see
M C Escher was the master: paradoxical stair
Descending up, ascending down - in the end you go nowhere!
Descending up, ascending down - and you go nowhere!
Descending up, ascending down - and you go nowhere!
And you go nowhere! And you go nowhere!

Optical illusions are your eyes and your brain
Being hijacked, hoodwinked, commandeered, but most of all entertained.
Optical illusions - most of all they entertain!

SONG 13. PERFECT PITCH
by Tim Maurice

SOPRANO:
They call it by name, or any note on the piano.
Perfect pitch, recognizing a note without a
ref'rence tone, solely by ear.

R S thirty fifty-seven
Ooo, for having perfect pitch.
It's called an S N P, a single nucleotide
polymorphism!
Perfect pitch, singing out a note without a
ref'rence tone, solely by ear.

With perfect pitch, you perceive ev'ry tone in the
way you would a color:
E A B C A F G A
Ahh, having perfect pitch is not only a result of
genetics.
Ahh,
The perfect combination of nature and nurture
together will give you
Perfect pitch, singing out a note without a
ref'rence tone, singing on my own,
La dee da dee da dee, la dee da da da,
La dee da dee da dee, la dee da da.

ALTO:
To hear a sound and know.
They know right away what the note is.
Perfect pitch, recognizing a note without a
ref'rence tone, solely by ear.

You may wonder what causes this ability,
The answer's partly biological.
There's a common genetic variation called
R S thirty fifty-seven.
Perfect pitch, singing out a note without a
ref'rence tone, solely by ear.

E F G F E F, E F sharp
Ahh, having perfect pitch is not only a result of
genetics.
It is equally environmental, an exposure to high
content music at an early age.
Ooo,

ALTO, continued:
Not to mention you need to study music indeed.
The perfect combination of nature and nurture
together will give you
Perfect pitch, singing out a note without a
ref'rence tone, singing on my own,
La dee da dee da dee, la dee da da da,
La dee da dee da dee, la dee da da.

BARITONE:
There's a rare musical ability found in one in ten
thousand people.
They seem to have the facility to hear a sound and
know what musical note it is,
Ooo, right away what the note is.
Could be a car horn or train, or any note on the
piano.
Perfect pitch, recognizing a note without a
ref'rence tone, solely by ear.

R S thirty fifty-seven
Ooo, a genetic predisposition,
It's called an S N P, a single nucleotide
polymorphism!
Perfect pitch, singing out a note without a
ref'rence tone, solely by ear.
A B C B A, A B C B A G A, G A
Ahh, having perfect pitch is not only a result of
genetics.
Ooo, just like learning a language,
Ahh internalizing phonemes.
The perfect combination of nature and nurture
together will give you
Perfect pitch, singing out a note without a
ref'rence tone, singing on my own,
La dee da dee da dee, la dee da da da,
La dee da dee da dee, la dee da da.

SONG 14. THE POWER OF HOW WE FEEL
by Lauren Mayer

To explore the world around us
We mostly use our ears and eyes
But we learn so much from our sense of touch
Maybe more than we realize

It's a sense that develops in the womb
And it helps us know what's real
So let's not wait to appreciate
The power of how we feel

Touch is a way of communicating
Our affection and empathy
Touch reduces strain even eases pain
And we use it constantly

It gives us useful information
And even helps our bodies heal
Touch can lessen stress, increase happiness
That's the power of how we feel

You can tell a touching story
Or say you felt it in your heart
But touch is more than a metaphor
It's a science and an art

Our skin is our largest organ
So when we hug or hold a hand
Warm feelings swerve through the vagus nerve
Causing good hormones to expand

A simple touch boosts oxytocin,
And that's just part of its appeal
Lowers cortisol and that's not all
Of the power of how we feel

So let's not wait to appreciate
The power of how we feel, of how we feel

SONG 15. ROY G BIV!
by Bruce Lazarus

Newton found white light splits up when shining through a prism
And seven colors form the spectrum's base chromaticism.
The colors can be recombined by sending them back through
But try to do the same with paint...you'll need some optimism.

Chorus:
Roy G Biv, White light is bent transformative,
Roy G Biv, The colors are consecutive
Roy G Biv, It's time to be informative
Red and orange yellow green blue indigo and violet
Roy G Biv, The colors of the spectrum
Roy G Biv, An acronym that's rather dumb
Roy G Biv, Still it helps remember some
Red and orange yellow green blue indigo and violet

Spectroscopes are used to study light from outer space.
Rainbows may be Roy G Biv's most lovely bands of grace.
We see spectrums all the time in fountains and lawn sprinklers,
But R O Y G B I V is never commonplace.

Repeat Chorus

Some say rainbows end in pots of gold.
True that they're a wonder to behold,
But common sense says there's a major hitch,
Would that it were true, we'd all be rich!

Repeat Chorus

Roy G Biv!

SONG 16. SINGLE PHOTON
by David Haines

I sit alone in the dark, dark, dark, dark, dark, dark, dark room
I'm staring straight ahead and not sure what I'm trying to see
I push a button, hear two sounds a second apart then have to say
Did I see a photon with the second sound?
And how sure am I on a scale of one to three?

Is it truly possible for humans to perceive
A single isolated, elementary
Quantum particle of light
Can we really see a lone photon?
A single solitary photon?
Single photon?

"The most amazing thing is that it's not like seeing light
It's almost a feeling at the threshold of imagination"
Considering that ninety per cent of the photons entering the front of the eye
Will never ever reach a rod cell
My score of more than fifty percent is remarkably high!

Is it truly possible for humans to perceive
A single isolated, elementary
Quantum particle of light
Can we really see a lone photon?
A single solitary photon?
Single photon?

Is it truly possible for humans to perceive
A single isolated, elementary
Quantum particle of light
Can we really see a lone photon?
A single solitary photon?
Single photon?

Commissioned by North Cambridge Family Opera

NB The two lines in quotation marks are from a personal account by Alipasha Vaziri,
a physicist at the Rockefeller University, New York City

SONG 17. SIX DOTS
by David Haines

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

SONG 18. TINNITUS
by David Bass

SONG 19. THAT'S HOW THINGS ARE SEEN
by Bruce Lazarus

The ballerina pirouettes or executes fouetté turns -
But frame by frame, front-side-back-side is all the eye discerns.
The mind knows how to smooth this out
Inferring what the eye leaves out
We're left with little room to doubt
She's spinning round and round,
And round, and round, and round, and round.

The ballerina leaps across the stage; it's called a "tour jeté" –
The seats and stage will stay in place and all will be okay.
The mind knows that our eyes have moved
And not the seats or stage have moved.
Our understanding much improved:
Our brain came through again!

Vision is a partnership
Engaging eyes and mind, engaging eyes and mind!!
Without our brains' interpreting
We might as well be blind, we might as well be blind!
Vision isn't like we're watching
Movies on a screen, movies on a screen, movies on a screen!
We use our eyes and brains together
That's how things are seen, that's how things are seen, that's how things are seen,
That's how things are seen, that's how things are seen!

Her arms, her head, her legs reveal without a word her present mood–
Contentment, or sadness, or falling in love, are easily construed.
The mind discerns her inner state,
The moods to which we all relate.
Our eyes and mind are really great!
Now please enjoy the show while eyes and mind collaborate.

SONG 20. TOPSY-TURVY VISION
by Ruth Hertzman-Miller and Meg Muckenhoupt

Tutti:
Topsy turvy vision switches you around.
Top to bottom, side to side, up to upside down.
When you see an apple, maybe apple pie,
The vision's only starting when the light gets to your eye.

Soprano:
You see the light get switched around
Upside down.

Alto, Tenor, Bass:
Light that hits the lens will all get switched around
Reversing top to bottom till the apple's upside down.

Tutti:
Topsy turvy vision switches you around.
Top to bottom, side to side, up to upside down.
Light is the beginning, vision is the goal.
Your brain takes every scene apart so you can see the whole.

Soprano:
Now you have an image: an apple or a pie
That travels through your eyeball the lining of your eye.
Left side to the brain.
The right to the right, but will they meet again?

Alto, Tenor, Bass:
Now you have an image: a tasty pie
Eyeball to the retina, the lining of your eye.
The left side of the image travels to the left side brain.
The right side travels to the right, but will they meet again?

Tutti:
Will they meet? When will they meet again?
Topsy turvy vision switches you around.
Top to bottom, side to side, up to upside down.
Light is the beginning, vision is the goal.
Your brain takes every scene apart so you can see the whole.

Tutti:
At the optic chiasm the nasal neurons cross;
the temporal stay on their course.
But because of the flipping, each side perceives
the rays from the opposite source.

Soprano, Alto, Tenor:
Topsy turvy vision switches you around.
Top to bottom, side to side, up to upside down.
Light is the beginning, vision is the goal.
Your brain takes every scene apart so you can see the whole.

Bass:
Topsy turvy vision switches you around.
Up to upside down.
Light begins it.
Vision wins it.
See the whole.

Soprano:
The visual cortex maintains the separation.
The corpus callosum performs the integration.
Connecting halves are one.
You see a whole; the crossing dance is done!

Alto, Tenor, Bass:
Separation.
The corpus callosum performs the integration.
Connecting right and left until the halves are one.
You see the apple as a whole; the crossing dance is done!

Tutti:
Topsy turvy vision switches you around.
Top to bottom, side to side, up to upside down.
Light is the beginning, vision is the goal.
Your brain takes every scene apart so you can see the whole.

SONG 21. VIRUS, COVID EDITION
by David Haines (COVID additions by David Bass)

Without you I am nothing at all, I'm just a bundle of proteins, not even living
Until you take me into your body, let me into your cells, I'm not alive.
You are my home, you are my route to life.
You let me live in your cells where I can copy my
Proteins and ribonucleic acid, proteins and ribonucleic acid,
R.N.A.!

When I was coughed out of somebody's lungs,
I was a bundle of proteins, not even living.
Then you breathed me right into your body, let me into your cells, now I'm alive!
Your body's cells take orders from your genes,
But now they're learning to make perfect copies of my
Proteins and ribonucleic acid, proteins and ribonucleic acid,
R.N.A.!

Before you there was just one of me, you were not socially distant, now you've got Covid,
And you've donated me the use of your cells so I could multiply thousands of times.
You wrapped my babies up in phlegm and slime.
You coughed them out into the air spreading copies of my
Proteins and ribonucleic acid, proteins and ribonucleic acid,
R.N.A.!

I want to thank you for all that you've done, it's been a bundle of fun.
You've done your utmost to help me spread my R.N.A. all around, now please
Please will you cough me out? - I want a new host!

SONG 22. WHAT DO YOU SEE, BUTTERFLY?
by Michael Ching and Jennifer L. Knox

What do you see, butterfly? What do you see?
My eyes can see more colors than all other creatures.
Stripes and spots on the wing of my sisters and my brothers,
Glow like stained glass windows ringed in ultra-violet halos.

What do you see little bat? What do you see?
Who said that I am blind? Why that is quite a lie!
My trusty eyes, they gather light from night when there is none!

Part A	Part B
Bzz_____ Bzz_____	
Bzz_____ Bzz_____	The microscopic wing of gnats?
Bzz_____ Bzz_____	
Bzz_____ Bzz_____	I swoop on their annoying swarms!

All:
Bzz_____ Bzz_____ Eeee! Mmm, very tasty.

What do you see, cuttlefish? What do you see?
My eyes see three sixty degrees of sea around me.
Though my skin twirls and swirls through the polarized spectrum
Like a twinkling carnival ride, Mm___ Mm___
My salty world is veiled in grey
Ah-----mm-----ah-----mm Ah_____

What do you see, kitty cat? What do you see?
I laugh at you when you are stumbling in the dark! Ow!
The dimmest light still makes the night shine bright to me!
My eyes all black under the couch… Grrrr! Grrrr!
Just like a leopard ready to pounce! Grrrr! Grrrr! Meow!

SONG 23. A WORLD OF SOUND
by Bruce Lazarus

Before we were born we listened to our mother's heartbeat
But this was only the start.
Bit by bit we became aware of the world out there.

And it's a world of sound
Vibrations propagating through the air are all around.
This is a world of sound.
Music is all around
So listen…

Your mother's voice - Your father's voice -
Whispers and whimpers and murmurs and giggles.

Music is all around
So listen…

A barking dog – A purring cat.
The birds that sing - The bells that ring.
Children play - A noisy day of crackles and cackles and screaming and shouting.

And sometimes there's an echo -
Echo, echo, echo, echo, echo.

And it's a world of sound
Vibrations propagating through the air are all around.
This is a world of sound.
Music is all around
So listen…

A baby's cry - A lullaby.
The buzzing bees - The wind through trees.

Thunder - A raging storm.

A waterfall.
Fireworks!

A simple song –
Not very long –
You can't go wrong.

A concerto and the grandest symphony!

It's all a world of sound
Vibrations propagating through the air are all around.
This is a world of sound.
Music is all around
Just listen.