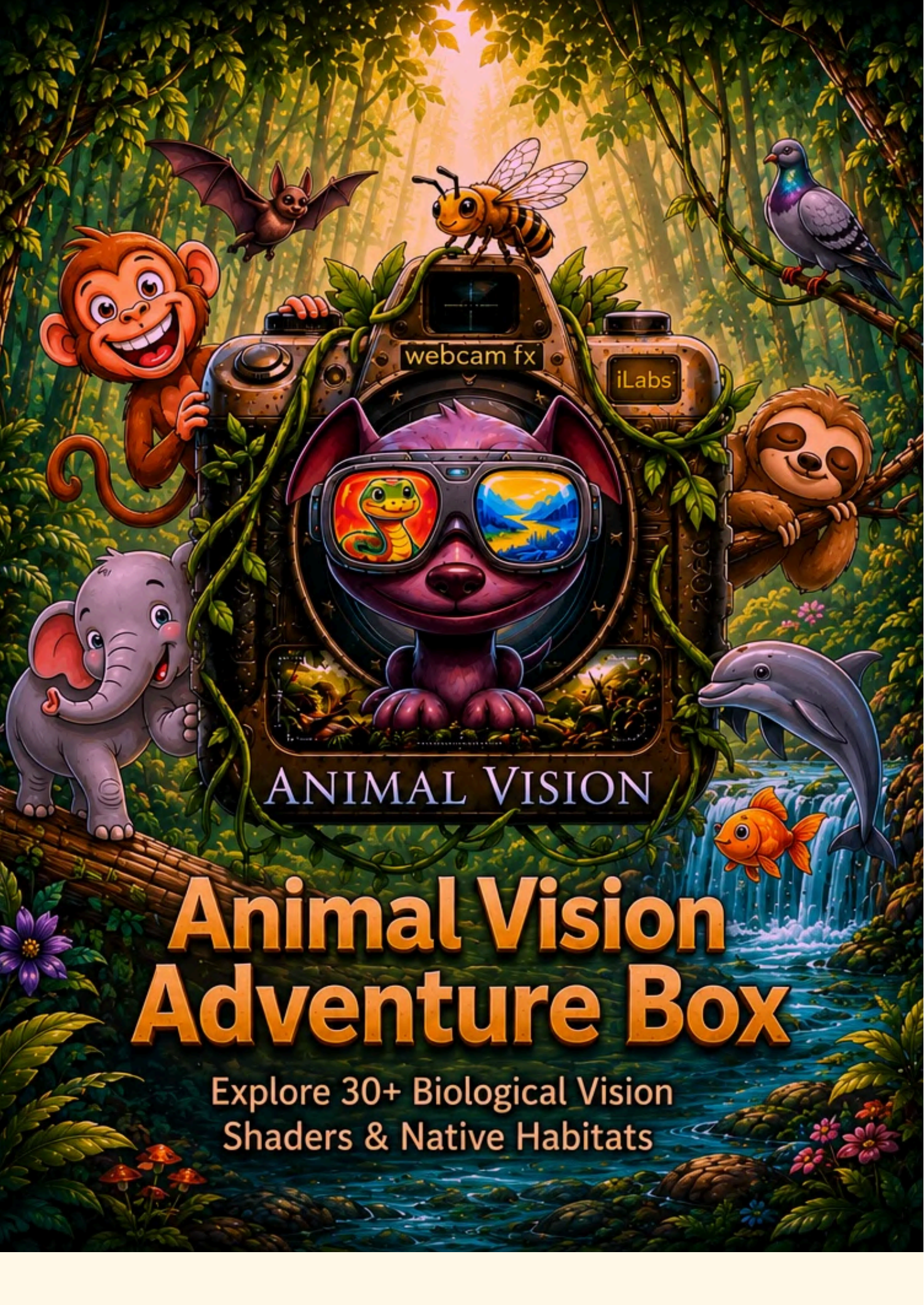




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ANIMAL VISION

Animal Vision Adventure Box

Explore 30+ Biological Vision
Shaders & Native Habitats

How to Use Your Animal Vision Kit

The Animal Vision app uses computer vision shaders and your phone's camera to simulate how each animal sees the world in real-time. Follow these 3 easy steps to begin:



SCAN TO OPEN APP →

1

Print the QR Cards

Scroll to Section II of this PDF and print the 6 cards on standard paper or cardstock.

2

Scan with Companion App

Open the app (iPhone, iPad or Android, or Web) and point your camera at the printed animal card.

3

Explore Through Their Eyes!

Look around your room or backyard through ultraviolet, thermal heat, mosaic facets or echolocation.



100% Kid-Safe & Works Completely Offline

Family friendly • No personal data collection • Runs smoothly on all devices.

Master Table of Contents

PART I: 6–ANIMAL STEM FIELD GUIDE →

- How Eyes Work: Anatomy, Photoreceptors & Shaders
- The 6 Starter Animals: Human, Human Baby, Dog, Cat, Honeybee, and Golden Eagle chapters

PART II: PRINTABLE AR QR TRADING CARDS →

- 6 High-Res Collectible Cards with QR Scan Triggers (Print & Cut)

PART III: TEACHER LESSON PLAN & EDUCATOR GUIDE →

- Executive Overview & NGSS Alignment Pillars
- Lesson 1: Free Exploration & Discovery (30–40 min)
- Lesson 2: Guided Photoreceptor Comparison (40–45 min)
- Lesson 3: Station Rotation & Sensor Exploration (45–60 min)

PART IV: STUDENT ACTIVITY SHEETS & HANDS–ON LABS →

- Worksheet 1: Comparative Vision Observation Log
- Worksheet 4: My Favourite Vision Drawing Log
- Species Lab: Pit Viper Thermal IR Sensor Experiment
- Knowledge Check: Match the Animal to its Optical Adaptation
- Student Cutout Certificate: Junior Vision Explorer Award

PART V: COMPLETE 30–ANIMAL UPGRADE & THANK YOU →

- Complete 30–Animal Pack Feature Matrix & Educator Discount
- Personal Thank You Note from Praveen Ojha

SECTION I

6–Animal STEM Field Guide

Human, Human Baby, Dog, Cat, Honeybee, and Golden Eagle
species guides in exact app order.

ANIMAL VISION

ADVENTURE BOX • INTERACTIVE STEM BOOK

HOW ANIMALS SEE THE WORLD



SCAN TO DISCOVER ANIMAL
VISION APP

See the World Through the Eyes of 30 Amazing
Animals in Real Time!

30 SPECIES COMPREHENSIVE OPTICAL EXPLORATION

Designed & Developed by Praveen Ojha & Anshika Dixit • © 2026 WebCamFx Creative Team

PREFACE • WHY THIS BOOK WAS CREATED

Welcome to the Animal Vision Interactive STEM Field Guide. Human eyes perceive the physical universe through a narrow slice of electromagnetic radiation between 400 and 700 nanometers. Yet across the natural world, sensory architectures have evolved radical alternative optics—from nocturnal tapetum retroreflections and avian geomagnetic homing grids to pit viper thermal infrared mapping.

This publication was created to serve as the physical interactive companion to the Animal Vision Adventure Box. By combining real-time GPU matrix transformations with authoritative ocular anatomy specifications, this guide bridges biological field science and digital computer optics for students, educators, and natural science explorers.

Every species entry features real-world habitat distribution maps, cone photoreceptor channel breakdowns, and direct optical QR launch triggers. Scan any code within this guide to immediately experience live video through the eyes of nature's most extraordinary creatures.

 EXPLORE THE HIDDEN SPECTRAL REALMS OF NATURE • WEBCAMFX & ANSHIKA DIXIT

 Front Matter: i–v

 Species Atlas: 1–90

 Optical & Physics Glossary: vi–ix

ID	Species Name	Pages
#1	 Human	1–3
#2	 Human Baby	4–6
#3	 Dog	7–9
#4	 Cat	10–12
#5	 Honeybee	13–15
#6	 Snake (Pit Viper)	16–18
#7	 Golden Eagle	19–21
#8	 Great White Shark	22–24
#9	 Owl	25–27
#10	 Bat	28–30
#11	 Spider	31–33
#12	 Dolphin	34–36
#13	 Chameleon	37–39
#14	 Zebra	40–42
#15	 Turtle	43–45

ID	Species Name	Pages
#16	 Frog	46–48
#17	 Elephant	49–51
#18	 Lion	52–54
#19	 Red Panda	55–57
#20	 Koala	58–60
#21	 Giraffe	61–63
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#23	 Monkey	67–69
#24	 Penguin	70–72
#25	 Fox	73–75
#26	 Deer	76–78
#27	 Goldfish	79–81
#28	 Pigeon	82–84
#29	 Unicorn	85–87
#30	 Pegasus	88–90

DIGITAL FIELD GUIDE & NAV SUITE

Page Flipping & Navigation

Smooth gesture-based book swiping. Flip forward/backward through 30 species pages, tap directory index links, or use page jumper.

Visual UI Themes (Wood, Slate, Leather, Graph)

Switch surface themes in Settings between Wood, Slate, Leather, and Graph to customize textures & dark mode.

Species Key & Access Unlocks

Redeem physical book product key passcodes or watch quick rewarded video clips to instantly unlock all 30 animal GPU filters.

Built-In 33-Term STEM Glossary

Explore 33 optical physics terms (Wavelength λ , Refraction n , Cones, Tapetum) or open Wikipedia articles for deeper study.

LIVE CAMERA & SCANNER SUITE

Live Viewport & Photo/Video Controls

Pinch to zoom, tap to set focus/exposure, swipe to swap front/rear lenses, and record high-res photos or live filter videos.

Floating Eye 50/50 Split-Screen

Tap the floating Eye icon to split the live view 50/50, directly comparing simulated animal vision against raw human trichromatic sight.

Live In-App QR Scanner

Tap the camera QR Scanner button & scan any animal page QR code in this book to deep-link and instantly launch its GPU shader.

Gravity & Acoustic Sensor Overlays

Device 3D accelerometer, magnetometer compass, and microphone input drive gravity-oriented waterlines, echolocation & sonar waves.

 REAL-TIME SHADER ENGINE • OPTICAL VISION MODES

Our mobile application features real-time GPU matrix shader transformations to accurately model biological vision across different visual maturation stages and species baseline optics.

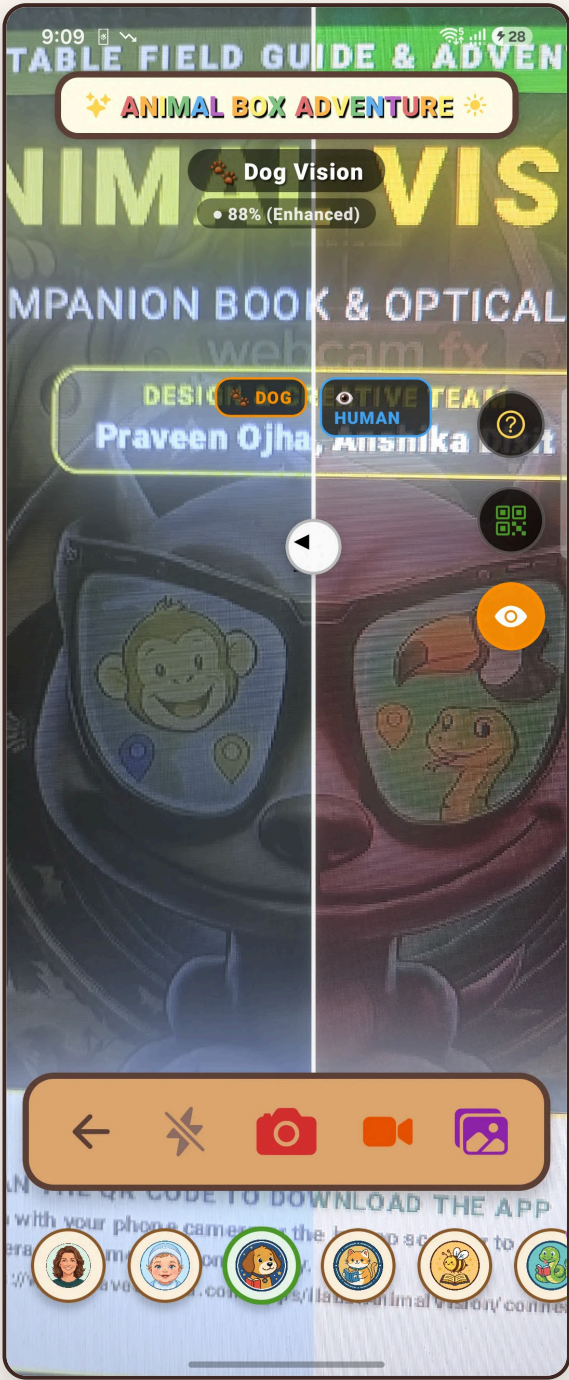
 INFANT VISION SIMULATOR (0–3 MOS)



Models immature foveal cone cell development with low contrast sensitivity, blurry focus beyond 10 inches, and monochromacy (Brown, 1990; Teller, 1997).

Pedagogical Notice: Simulated with contrast attenuation and desaturation to demonstrate foveal maturation between 0 and 6 months.

 ADULT TRICHROMATIC COMPARATOR



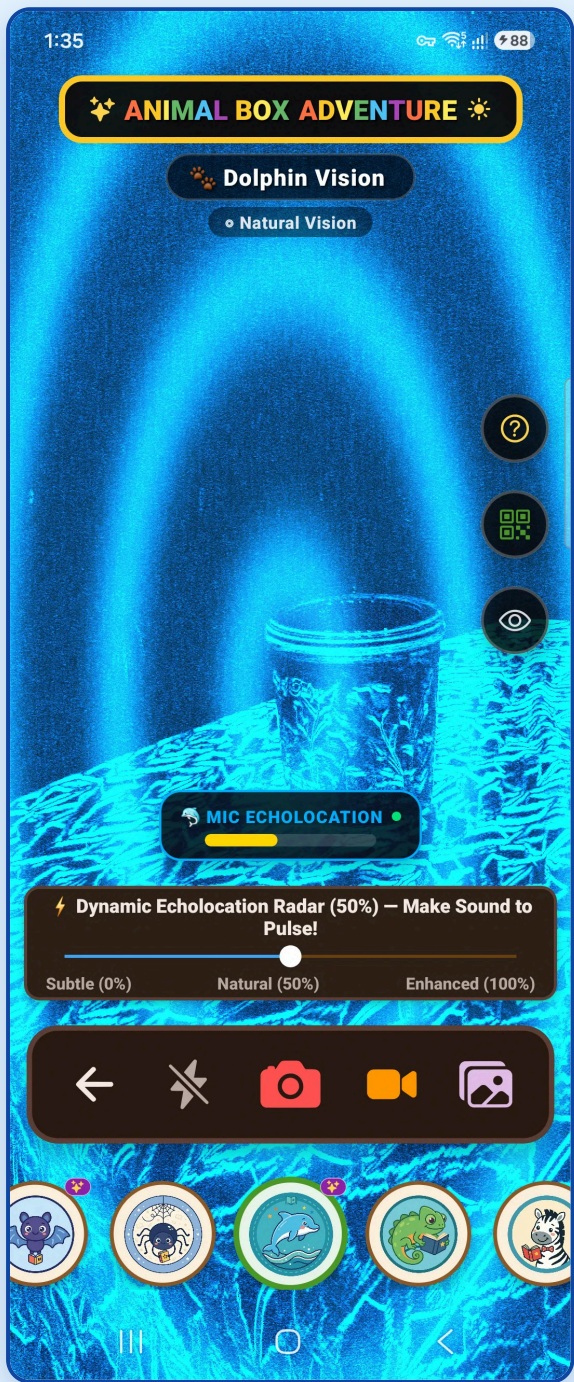
Baseline human visual perception utilizing full trichromatic RGB spectrum (S, M, L cones) with sharp 20/20 foveal resolution.

Comparator Notice: Interactive 50/50 split-screen slider enables instant side-by-side comparison between animal perception and human sight.

🦇🐬 SENSORY & THERMAL SIMULATION MODES

Beyond visible light wavelengths, the application models non-visual sensory modalities including high-frequency ultrasonic sonar reflections and thermal infrared radiation mapping.

🦇🐬 ULTRASONIC ECHOLOCATION SONAR



Models how Bats and Dolphins emit high-frequency acoustic waves (14–100 kHz) to reconstruct 3D acoustic echo maps in dark environments.

Acoustic Radar Notice: Device microphone input dynamically drives concentric pulse rings to visualize sound reverberation in real time.

🦎🔥 THERMAL INFRARED HEAT MAPPING



Models pit viper loreal facial pit organ membrane mapping 8,000–14,000 nm thermal infrared radiation directly onto the optic tectum.

Scientific Disclaimer: Consumer smartphone cameras operate exclusively within the visible RGB spectrum (~400–700 nm) and do not physically measure thermal or infrared radiation. The app renders research-informed mathematical GPU shaders to simulate how thermal gradients are perceived by biological pit organs.



HUMAN

Scientific Name: *Homo sapiens*

CONSERVATION: LEAST CONCERN

NATURAL HISTORY & EVOLUTIONARY ORIGINS

- Evolutionary Adaptations:** *Homo sapiens* evolved in East Africa approximately 300,000 years ago, descending from hominin ancestors who transitioned from arboreal canopy foraging to savanna bipedalism.
- Habitat Ancestry:** Adapted to thrive in Global terrestrial environments & urban centers.

OPTICAL THOUGHT EXPERIMENT

How do human eyes combine red, green, and blue light to distinguish over one million distinct colour shades?

🎯 **Explorer Challenge:** Look closely at your device screen. Notice how tiny red, green, and blue subpixels blend together to create every colour you see!

ECOLOGICAL ROLE & PHYSICAL ADAPTATIONS

- Ecological Role:** Global apex generalist species operating across every terrestrial biome on Earth.
- Physical Adaptations:** Bipedal skeletal structure, enlarged cerebral cortex (1,300 cm³), opposable thumbs for high-dexterity manipulation, and eccrine sweat glands.
- Diet & Foraging Strategy:** Omnivorous diet utilizing tool fabrication, persistence hunting, controlled fire cooking, and social coordination for food processing.

SPECTRAL MATRIX & CONE CHANNELS

- Visual System:** Trichromacy (3 Cone Types: S, M, L)
- Spectral Wavelengths:** 380 nm – 740 nm (Standard Visible Spectrum)
- Peak Channels:** λ_{max} = 420 nm (S-Blue), 530 nm (M-Green), 560 nm (L-Red)
- Sensory Modalities:** Fovea Centralis (150k cones/mm²) • Binocular 3D Depth Perception

S-Cone (Blue) (400–500 nm)

M-Cone (Green) (500–560 nm)

L-Cone (Red) (560–700 nm)



HUMAN

Global Ecological Profile

CONSERVATION: LEAST CONCERN

Population: Estimated 8.1 Billion (Global)

Primary Habitat: Global terrestrial environments & urban centers

SPECIES TAXONOMY & CLASSIFICATION

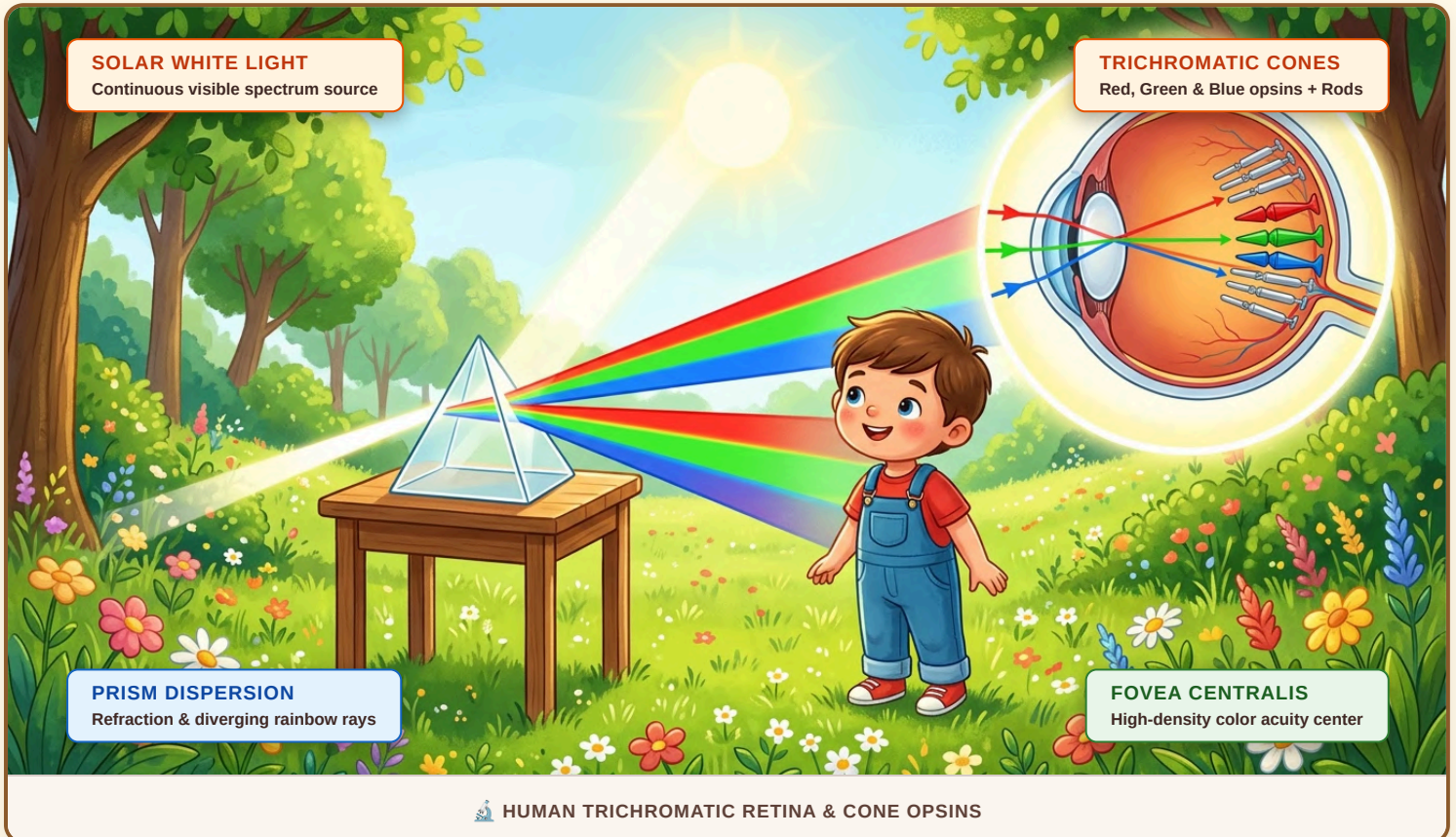
Kingdom: Animalia	Phylum: Chordata
Class: Mammalia	Order: Primates
Family: Hominidae	Genus: <i>Homo</i>
Scientific Name: <i>Homo sapiens</i>	

GLOBAL GEOGRAPHIC DISTRIBUTION MAP



👁 BIOLOGICAL SENSORY MECHANISM & SPECTRAL RECEPTORS

Humans possess trichromatic vision powered by three cone opsin types (S, M, L) packed tightly in the fovea centralis for acute red-green-blue color perception, surrounded by ~120 million rod photoreceptors for peripheral motion and dim-light detection.



STEM CARD DECK QR BRIDGE • HUMAN CARD

Scan this card's QR code from your physical 32-card STEM trading deck to launch the live optical simulator.

Human Card

🎯 Retinal Blind Spot Discovery Experiment

Draw a dot (•) and a plus (+) 3 inches apart on paper. Hold the paper at arm's length, cover your left eye, and stare at the plus sign with your right eye. Slowly bring the paper closer. At about 8 inches, the dot will vanish! That is your blind spot—where the optic nerve leaves the retina with zero photoreceptors.



HUMAN BABY

Scientific Name: *Homo sapiens* (Infant)

🛡️ CONSERVATION: LEAST CONCERN

🌿 NATURAL HISTORY & EVOLUTIONARY ORIGINS

- **Evolutionary Adaptations:** Post-natal human neural development spans the first 1,000 days of life, during which synaptogenesis in the occipital lobe establishes binocular vision.
- **Habitat Ancestry:** Adapted to thrive in Domestic environments & nurseries globally.



💡 OPTICAL THOUGHT EXPERIMENT

Why do newborn babies stare intently at high-contrast black and white patterns instead of soft pastel toys?

🎯 Explorer Challenge: Squint your eyes tight and look at a bright light through your eyelids. That warm, high-contrast glow is similar to early infant vision!

🌿 ECOLOGICAL ROLE & PHYSICAL ADAPTATIONS

- **Ecological Role:** Developing human organism dependent on parental care and social attachment for cognitive and physical maturation.
- **Physical Adaptations:** Flexible cranial fontanelles for birth canal navigation, palmar grasp reflex, and rapid myelination of central nervous system axons.
- **Diet & Foraging Strategy:** Strictly dependent on maternal breast milk or infant formula nutrition during early developmental stages.

📊 SPECTRAL MATRIX & CONE CHANNELS

- **Visual System:** Immature Foveal Monochromacy -> Trichromacy
- **Spectral Wavelengths:** 380 nm – 700 nm (Low Contrast Muted Grayscale)
- **Peak Channels:** Low Sensitivity (20/400 Blur, Red First)
- **Sensory Modalities:** Fontanelle Synaptogenesis • Palmar Visual Reflex

● Grayscale Rods (Low Contrast)

● Early Red Cone (560–650 nm)



HUMAN BABY
Global Ecological Profile

CONSERVATION: LEAST CONCERN

Population: Estimated 130 Million births annually

Primary Habitat: Domestic environments & nurseries globally

SPECIES TAXONOMY & CLASSIFICATION

Kingdom: Animalia	Phylum: Chordata
Class: Mammalia	Order: Primates
Family: Hominidae	Genus: <i>Homo</i>
Scientific Name: <i>Homo sapiens (Infant)</i>	

GLOBAL GEOGRAPHIC DISTRIBUTION MAP



👁 BIOLOGICAL SENSORY MECHANISM & SPECTRAL RECEPTORS

Newborn infants are born with immature maculae and short cone photoreceptors, limiting visual acuity to ~20/400. High-contrast monochrome rods develop first, enabling babies to focus best on bold black-and-white geometric patterns 8–12 inches away before full color trichromacy emerges.



STEM CARD DECK QR BRIDGE • HUMAN BABY CARD

Scan this card's QR code from your physical 32-card STEM trading deck to launch the live optical simulator.

Human Baby Card

🎯 High-Contrast Infant Visual Preference Test

Show a 2-month-old infant a pastel soft-colored toy alongside a bold black-and-white checkerboard card. Notice how the baby's gaze locks onto the high-contrast checkerboard! Their immature foveal cones cannot yet resolve subtle hues, making high-contrast monochrome edges their primary visual anchor.



DOG

Scientific Name: *Canis lupus familiaris*

CONSERVATION: LEAST CONCERN

NATURAL HISTORY & EVOLUTIONARY ORIGINS

- Evolutionary Adaptations:** *Canis lupus familiaris* diverged from an extinct wild wolf ancestor between 20,000 and 40,000 years ago during the Late Pleistocene epoch.
- Habitat Ancestry:** Adapted to thrive in Domestic environments & global communities.

OPTICAL THOUGHT EXPERIMENT

Why does your dog ignore a bright red toy sitting in green grass until you bounce it?

Explorer Challenge: Hold a colorful ball still across the room. Notice how much harder it is to spot than when it moves!

ECOLOGICAL ROLE & PHYSICAL ADAPTATIONS

- Ecological Role:** Domesticated companion and working animal, fulfilling roles in herding, protection, service, and wildlife tracking.
- Physical Adaptations:** Keen olfactory system (over 220 million scent receptors), non-retractable claws for endurance running, and acute auditory pinnae.
- Diet & Foraging Strategy:** Carnivorous and omnivorous foraging behavior, adapted for cooperative pack hunting, tracking scent trails, and scavenging.

SPECTRAL MATRIX & CONE CHANNELS

- Visual System:** Dichromacy (2 Cone Types: S & M/L)
- Spectral Wavelengths:** 430 nm – 550 nm (Red-Green Blindness)
- Peak Channels:** λ_{max} = 429 nm (S-Blue), 555 nm (Yellow/Green)
- Sensory Modalities:** Tapetum Lucidum Night Reflection Layer • High Rod Density Motion Tracking

Blue Cone (430–480 nm)

Yellow/Green Cone (520–580 nm)



DOG
Global Ecological Profile

CONSERVATION: LEAST CONCERN

Population: Estimated 900 Million (Global)

Primary Habitat: Domestic environments & global communities

SPECIES TAXONOMY & CLASSIFICATION

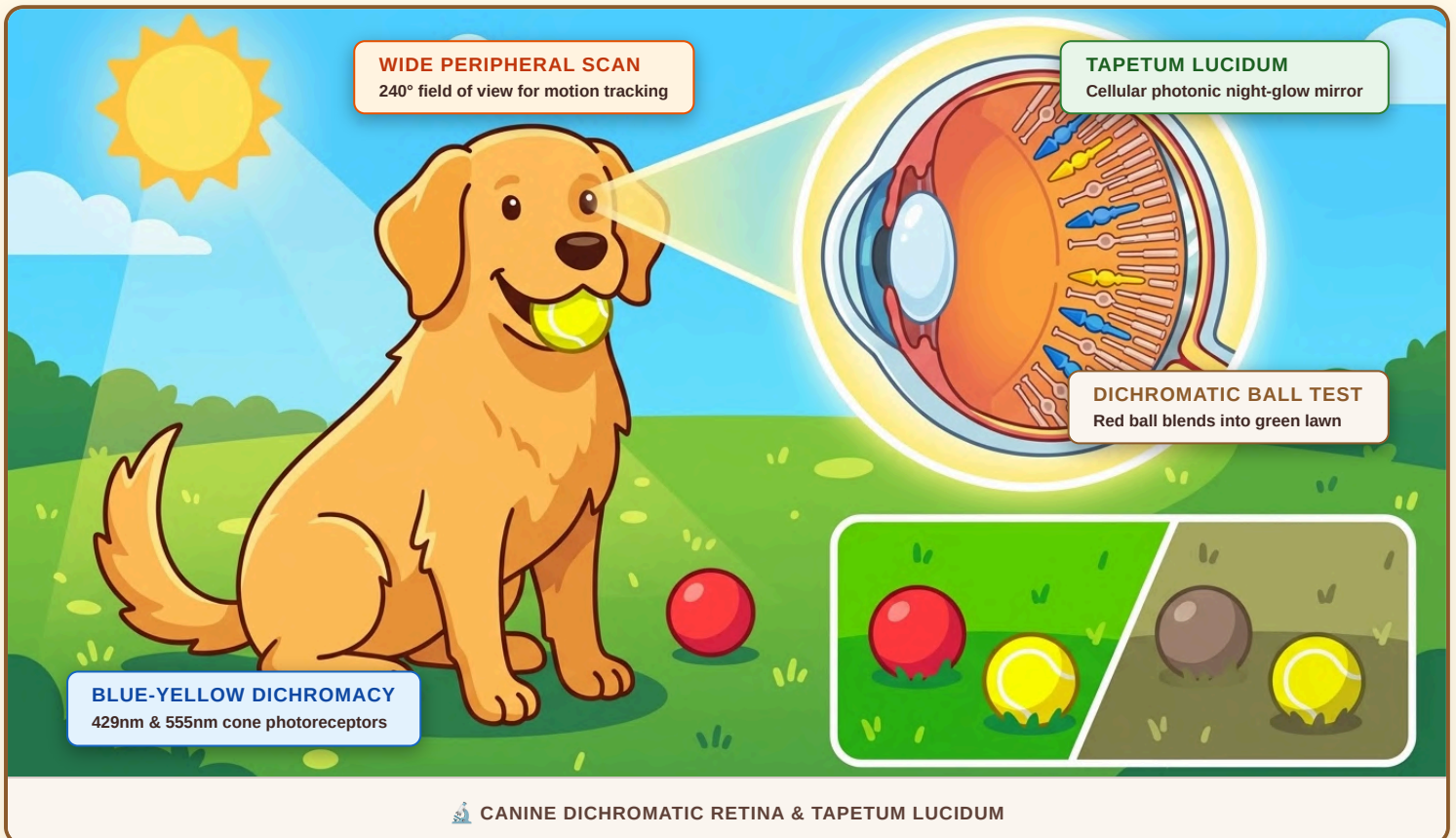
Kingdom: Animalia	Phylum: Chordata
Class: Mammalia	Order: Carnivora
Family: Canidae	Genus: Canis
Scientific Name: Canis lupus familiaris	

GLOBAL GEOGRAPHIC DISTRIBUTION MAP



👁 BIOLOGICAL SENSORY MECHANISM & SPECTRAL RECEPTORS

Canine vision is dichromatic, relying on blue and yellow-green cone opsins that render red and green as muted browns, while high rod density and a reflective tapetum lucidum provide superior low-light motion detection across a 240° field of view.



STEM CARD DECK QR BRIDGE • DOG CARD

Scan this card's QR code from your physical 32-card STEM trading deck to launch the live optical simulator.

Dog Card

🎯 Tennis Ball Contrast Experiment

Toss a red ball and a bright yellow ball onto green grass. Watch how a dog locates the yellow ball instantly by sight, but relies on scent to find the red ball because red blends with green grass in canine dichromatic vision.



CAT
Scientific Name: *Felis catus*

CONSERVATION: LEAST CONCERN

NATURAL HISTORY & EVOLUTIONARY ORIGINS

- Evolutionary Adaptations:** *Felis catus* was domesticated in the Near East around 7500 BC from African wildcats (*Felis lybica*) to protect grain stores from rodents.
- Habitat Ancestry:** Adapted to thrive in Domestic homes & wild global habitats.



OPTICAL THOUGHT EXPERIMENT

How can a cat pounce effortlessly on a tiny mouse in near-total darkness?

Explorer Challenge: Turn down the room lights and try finding a small toy on the floor. Imagine your eyes having built-in night vision mirrors!

ECOLOGICAL ROLE & PHYSICAL ADAPTATIONS

- Ecological Role:** Small mammalian predator controlling rodent populations across urban and rural environments.
- Physical Adaptations:** Retractable claws, flexible spine, specialized tapetum lucidum, and sensitive whiskers (vibrissae).
- Diet & Foraging Strategy:** Obligate carnivore hunting small rodents and birds using stalk-and-pounce tactics.

SPECTRAL MATRIX & CONE CHANNELS

- Visual System:** Dichromacy + Nocturnal Tapetum Gain
- Spectral Wavelengths:** 450 nm – 550 nm (Blue-Green Spectrum)
- Peak Channels:** λ_{max} = 450 nm (Blue), 554 nm (Green)
- Sensory Modalities:** Tapetum Lucidum (6x Low-Light Boost) • Vertical Slit Pupil (135x Constriction)

Blue Cone (440–480 nm)

Green Cone (520–560 nm)

Tapetum Eyeshine (6x Light Gain)



CAT
Global Ecological Profile

CONSERVATION: LEAST CONCERN

Population: Estimated 600 Million (Global)

Primary Habitat: Domestic homes & wild global habitats

SPECIES TAXONOMY & CLASSIFICATION

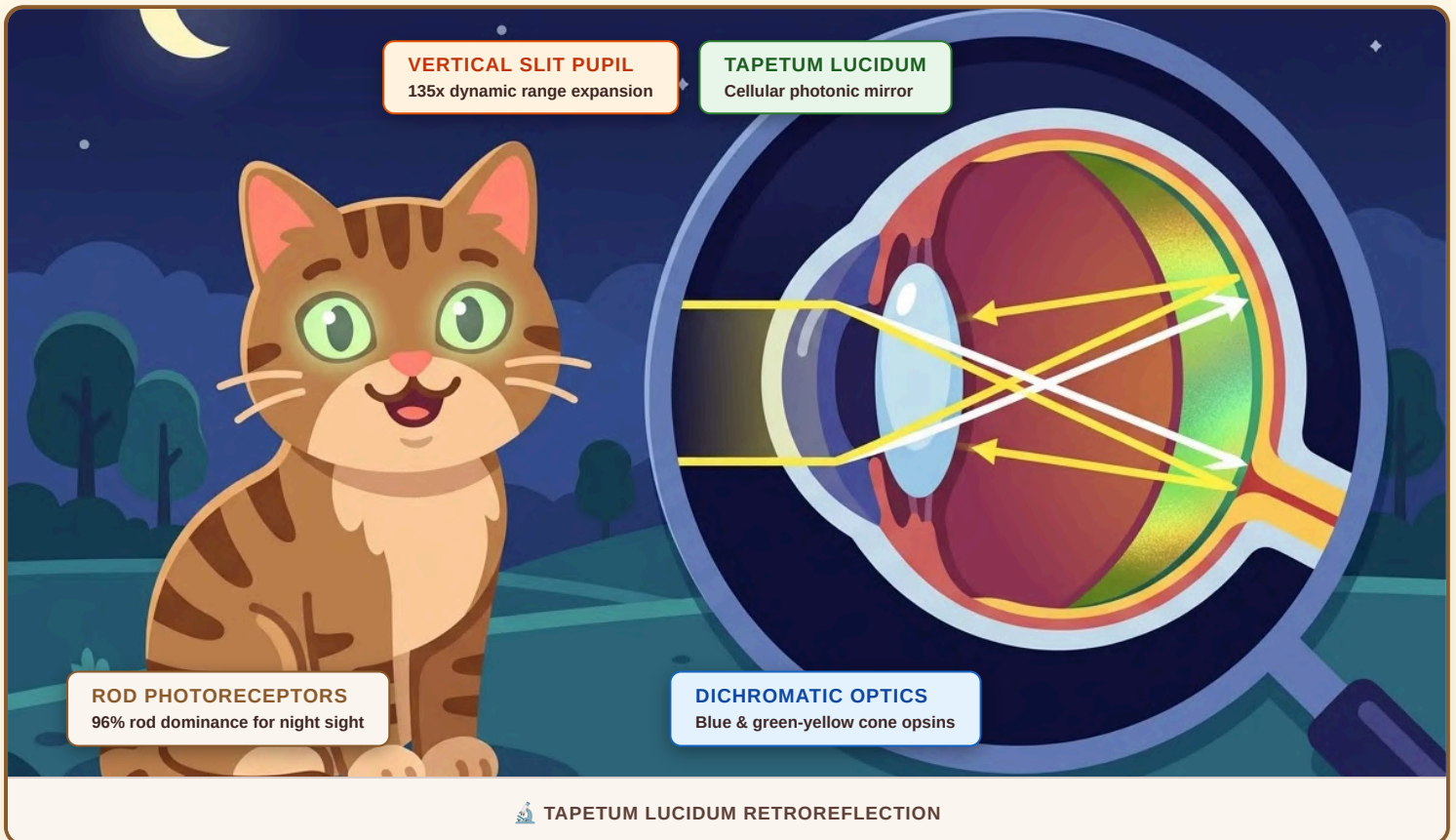
Kingdom: Animalia	Phylum: Chordata
Class: Mammalia	Order: Carnivora
Family: Felidae	Genus: <i>Felis</i>
Scientific Name: <i>Felis catus</i>	

GLOBAL GEOGRAPHIC DISTRIBUTION MAP



👁 BIOLOGICAL SENSORY MECHANISM & SPECTRAL RECEPTORS

Feline eyes contain a cellular mirror layer (tapetum lucidum) behind the retina that bounces unabsorbed photons back through photoreceptors for 6x nocturnal light amplification.



STEM CARD DECK QR BRIDGE • CAT CARD

Scan this card's QR code from your physical 32-card STEM trading deck to launch the live optical simulator.

Cat Card

🎯 Night Prowler Flashlight Experiment

Shine a dim red light into a darkened room. Observe how a cat's retroreflective eye-shine glints green-gold while human eyes exhibit only a faint red pupil reflection.



HONEYBEE

Scientific Name: *Apis mellifera*

CONSERVATION: VULNERABLE

NATURAL HISTORY & EVOLUTIONARY ORIGINS

- **Evolutionary Adaptations:** *Apis mellifera* evolved in Africa and Eurasia during the early Eocene epoch alongside flowering angiosperm plants.
- **Habitat Ancestry:** Adapted to thrive in Meadows, agricultural fields, forests & hives.

OPTICAL THOUGHT EXPERIMENT

How does a honeybee zoom straight to a hidden drop of nectar in a garden of thousands of flowers?

 **Explorer Challenge:** Look closely at a flower petal. Imagine secret glowing bullseye targets pointing straight to the center!

ECOLOGICAL ROLE & PHYSICAL ADAPTATIONS

- **Ecological Role:** Keystone insect pollinator critical for agricultural crop production and wild plant reproduction.
- **Physical Adaptations:** Pollen baskets (corbiculae) on hind legs, barbed sting apparatus, and polarized light navigation.
- **Diet & Foraging Strategy:** Eusocial herbivore collecting floral nectar and protein-rich pollen to sustain hive colonies.

SPECTRAL MATRIX & CONE CHANNELS

- **Visual System:** Trichromacy (UV, Blue, Green)
- **Spectral Wavelengths:** 300 nm (UV-A) – 650 nm (Red Blind)
- **Peak Channels:** λ_{max} = 344 nm (UV), 436 nm (Blue), 544 nm (Green)
- **Sensory Modalities:** Polarized Light E-Vector Navigation • Compound Ommatidia Grid (5k lenses)

 **UV Cone** (300–400 nm)

 **Blue Cone** (400–480 nm)

 **Green Cone** (500–600 nm)



HONEYBEE
Global Ecological Profile

CONSERVATION: VULNERABLE

Population: Estimated Trillions (Global)

Primary Habitat: Meadows, agricultural fields, forests & hives

SPECIES TAXONOMY & CLASSIFICATION

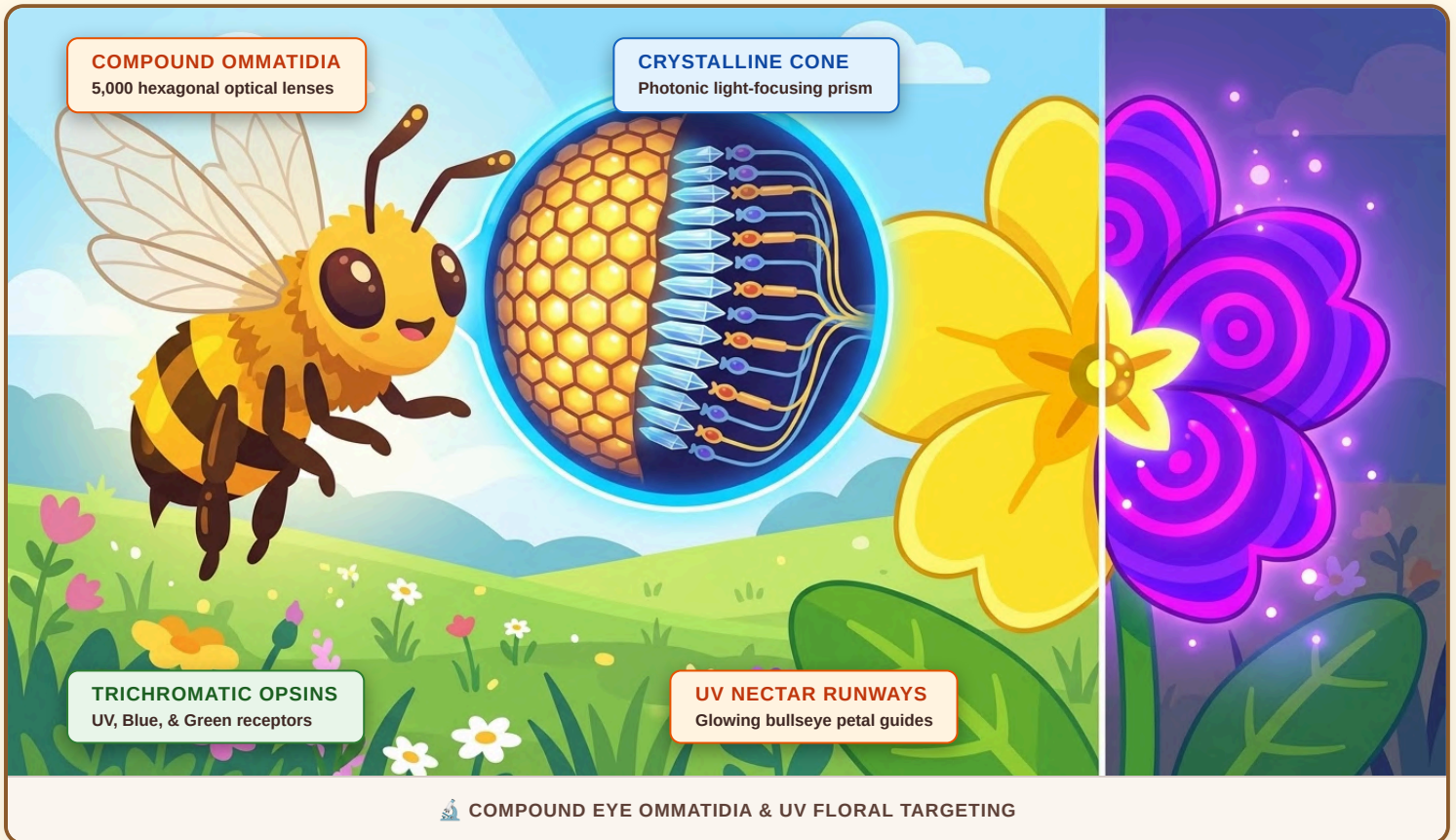
Kingdom: Animalia	Phylum: Arthropoda
Class: Insecta	Order: Hymenoptera
Family: Apidae	Genus: <i>Apis</i>
Scientific Name: <i>Apis mellifera</i>	

GLOBAL GEOGRAPHIC DISTRIBUTION MAP



👁 BIOLOGICAL SENSORY MECHANISM & SPECTRAL RECEPTORS

Honeybees possess compound eyes composed of ~5,000 hexagonal ommatidia units. Their trichromatic vision peaks in ultraviolet (340nm), blue (430nm), and green (540nm), unlocking hidden nectar runways on flower petals that remain completely invisible to human eyes.



STEM CARD DECK QR BRIDGE • HONEYBEE CARD

Scan this card's QR code from your physical 32-card STEM trading deck to launch the live optical simulator.

Honeybee Card

🕒 Blacklight Floral Secret Experiment

Take a 395nm UV blacklight torch into a garden or flower bouquet in a pitch-dark room. Observe how seemingly plain yellow dandelions and primroses reveal glowing fluorescent bullseye patterns pointing honeybees directly to the central nectar glands.



GOLDEN EAGLE

Scientific Name: *Aquila chrysaetos*

CONSERVATION: LEAST CONCERN

NATURAL HISTORY & EVOLUTIONARY ORIGINS

- **Evolutionary Adaptations:** *Aquila chrysaetos* evolved in the Northern Hemisphere during the Pliocene epoch, becoming an dominant avian predator across Holarctic mountain zones.
- **Habitat Ancestry:** Adapted to thrive in Mountains, forests, coastlines & open plains.

OPTICAL THOUGHT EXPERIMENT

How can a golden eagle spot a tiny mouse hiding in tall grass from thousands of feet up in the clouds?

🎯 **Explorer Challenge:** Look at a tiny sign far down the street. Imagine zooming in 8x crisp clarity without binoculars!

ECOLOGICAL ROLE & PHYSICAL ADAPTATIONS

- **Ecological Role:** Apex avian predator regulating small mammal populations and maintaining raptor biodiversity across alpine ecosystems.
- **Physical Adaptations:** Massive curved talons, broad 2-meter wingspan for soaring thermals, hooked beak, and telescopic dual foveae.
- **Diet & Foraging Strategy:** Apex avian predator hunting hares, marmots, ground squirrels, and young ungulates from high-altitude soaring dives up to 320 km/h.

SPECTRAL MATRIX & CONE CHANNELS

- **Visual System:** Tetrachromacy (UV, Blue, Green, Red)
- **Spectral Wavelengths:** 370 nm (UV-A) – 750 nm
- **Peak Channels:** λ_{max} = 370 nm (UV), 450 nm (Blue), 535 nm (Green), 605 nm (Red)
- **Sensory Modalities:** Deep Fovea Centralis (1 million cones/mm²) • Oil Droplet Light Filter Spheres

UV Cone (370–400 nm)

Blue Cone (400–500 nm)

Green Cone (500–580 nm)

Red Cone (580–750 nm)



GOLDEN EAGLE
Global Ecological Profile

CONSERVATION: LEAST CONCERN

Population: Estimated 300,000 (Stable)

Primary Habitat: Mountains, forests, coastlines & open plains

SPECIES TAXONOMY & CLASSIFICATION

Kingdom: Animalia	Phylum: Chordata
Class: Aves	Order: Accipitriformes
Family: Accipitridae	Genus: <i>Aquila</i>
Scientific Name: <i>Aquila chrysaetos</i>	

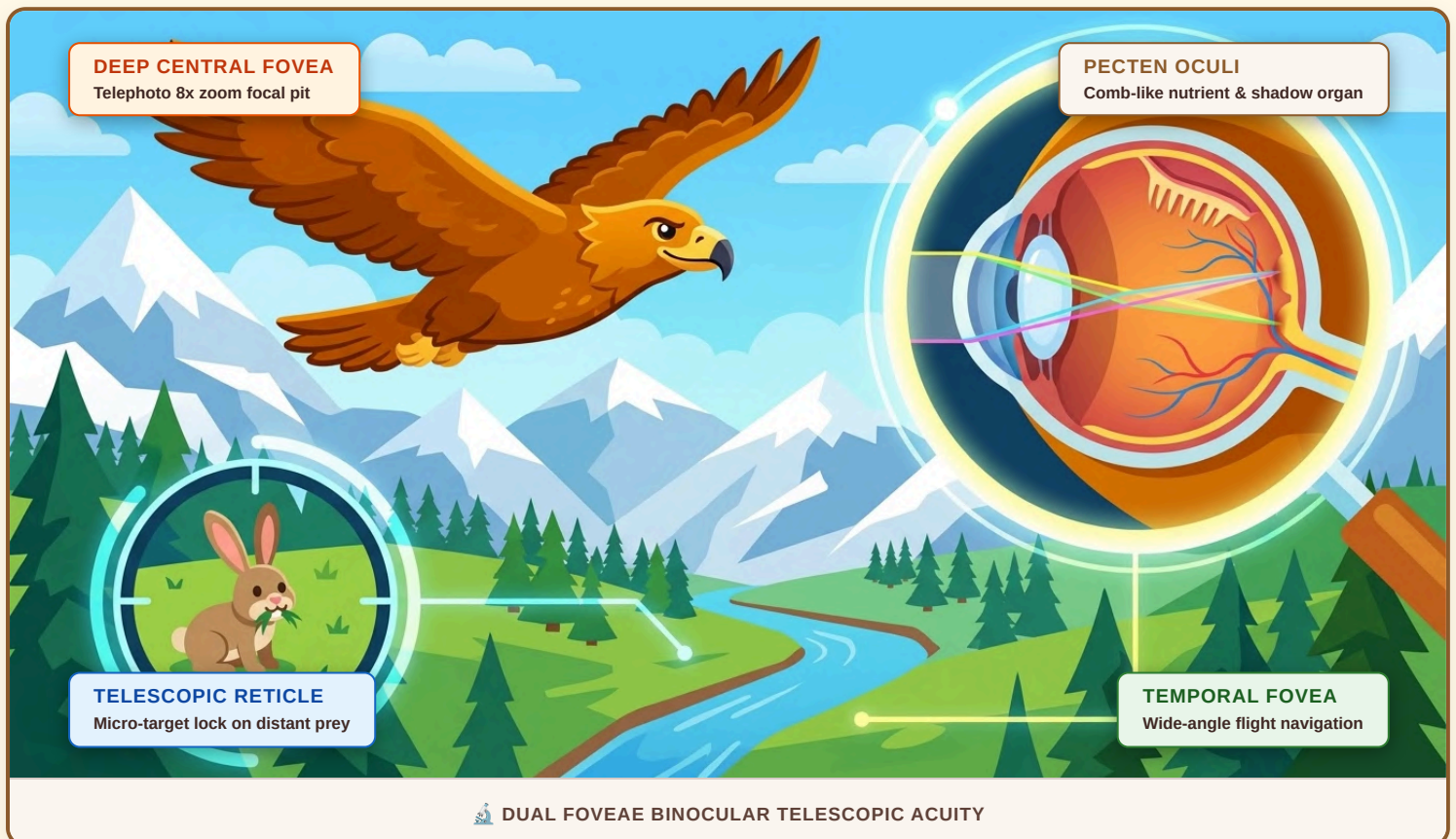
GLOBAL GEOGRAPHIC DISTRIBUTION MAP



- HIGH DENSITY
- MED DENSITY
- LOW DENSITY

BIOLOGICAL SENSORY MECHANISM & SPECTRAL RECEPTORS

Golden eagles possess dual foveae (central deep zoom & temporal navigation) containing up to 1,000,000 cones per mm²—providing 4x to 8x human visual acuity to lock onto small prey miles away while maintaining broad flight orientation.



STEM CARD DECK QR BRIDGE • GOLDEN EAGLE CARD

Scan this card's QR code from your physical 32-card STEM trading deck to launch the live optical simulator.

Golden Eagle Card

Cardboard Telescope Acuity Experiment

Roll a dark sheet of paper into a narrow 1-inch tube. Look at a distant tree through the tube with one eye while keeping the other eye open. Observe how your brain fuses the magnified narrow focus with the wide peripheral view, mimicking the dual foveae of an eagle in flight!

SECTION II

Printable AR QR Trading Cards

Print at home on cardstock • Cut and fold • Scan with your phone camera to explore through their eyes.

HUMAN

Human (*Homo sapiens*)



animalvision://0

OPTICAL SPECS:

SPECTRAL BAND:

380 nm to 740 nm (Standard Visible Spectrum).

LIGHT SENSITIVITY:

- Moderate daylight adaptation.
- Lacks a tapetum lucidum reflection layer.

FIELD OF VIEW:
180° Panoramic Span

RETINA & OPTICS:

Humans have three types of cone cells (S, M, L) packed into the fovea centralis for high-resolution trichromatic color vision (Curcio et al., 1990).

SIMULATION:

Serves as the baseline control screen, displaying the raw camera feed in full high-fidelity RGB color with no filters applied.

SPECTRUM SCIENTIST

#0

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VISION SIDE

HUMAN BABY

Human Baby (*Homo sapiens (Infant)*)



animalvision://1

OPTICAL SPECS:

SPECTRAL BAND:

Low-contrast grayscale at birth, developing red color sensitivity within weeks.

LIGHT SENSITIVITY:

Immature fovea centralis capturing only 20% of incident light.

FIELD OF VIEW:
180° Panoramic Span

RETINA & OPTICS:

Infants are born with immature cone photoreceptors and a developing visual cortex, resulting in low visual acuity and monochromatic blur (Brown, 1990; Teller, 1997).

SIMULATION:

Simulates newborn sight with monochromatic gray vision, low contrast, and age slider progression (0 to 6 months) to full trichromatic color maturation.

HIGH-CONTRAST EXPLORER

#1

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VISION SIDE

DOG

Dog (*Canis lupus familiaris*)



animalvision://2

OPTICAL SPECS:

SPECTRAL BAND:

430 nm to 550 nm (Red-green color blindness).

LIGHT SENSITIVITY:

High night vision sensitivity due to a 20:1 rod-to-cone ratio and tapetum lucidum mirror layer.

FIELD OF VIEW:
180° Panoramic Span

RETINA & OPTICS:

Dogs are dichromats possessing two cone cell types (S-blue and M/L-yellow), lacking red photoreceptors (Neitz, Geist, & Jacobs, 1989).

SIMULATION:

Replicates canine dichromacy by mapping reds and greens to a yellow-blue spectrum with soft peripheral motion awareness.

BLUE-YELLOW TRACKER

#2

© Copyright WebcamFX, Anshika Dixit

VISION SIDE

CAT

Cat (*Felis catus*)



animalvision://3

OPTICAL SPECS:

SPECTRAL BAND:

Muted blue and green spectrum (440 nm to 560 nm).

LIGHT SENSITIVITY:

6x higher low-light sensitivity than humans, assisted by vertical slit pupils.

FIELD OF VIEW:
180° Panoramic Span

RETINA & OPTICS:

Cats have dichromatic vision with a high concentration of rod cells and a reflective tapetum lucidum layer (Ollivier et al., 2004).

SIMULATION:

Low-light nocturnal dichromacy with 6x tapetum lucidum gain, glowing cyan eyeshine, and vertical slit pupil vignetting.

TAPETUM LUCIDUM PRO

#3

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VISION SIDE

HUMAN BABY

Human Baby (*Homo sapiens (Infant)*)

VISION & SENSES



VISION & SENSES WIKI



ECOLOGY & SPECIES WIKI FACTS:

- Newborn visual acuity is estimated between 20/400 and 20/800.
- At birth, the fovea centralis is structurally immature, with wide stubby cone cells.
- High-contrast geometric patterns (black and white) stimulate infant retinal cells most effectively.

MONOCHROME TRAIL SENSOR

#1

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WIKI SIDE

HUMAN

Human (*Homo sapiens*)

VISION & SENSES



VISION & SENSES WIKI



ECOLOGY & SPECIES WIKI FACTS:

- Human visual perception relies on the macula lutea and its central 1.5mm fovea, containing over 150,000 cone photoreceptors per mm².
- Trichromacy evolved in early primates roughly 35 million years ago, allowing ancestors to distinguish reddish young leaves and ripe fruit against green forest canopies.

HOMO SAPIENS VISIONARY

#0

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WIKI SIDE

CAT

Cat (*Felis catus*)

VISION & SENSES



VISION & SENSES WIKI



ECOLOGY & SPECIES WIKI FACTS:

- *Felis catus* eyes feature vertical slit pupils capable of contracting 135-fold in bright sun while expanding fully at night.
- Their tapetum lucidum reflects light through rod cells twice, producing iconic yellow-green eyeshine glow.

CREPUSCULAR AMBUSH MASTER

#3

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WIKI SIDE

DOG

Dog (*Canis lupus familiaris*)

VISION & SENSES



VISION & SENSES WIKI



ECOLOGY & SPECIES WIKI FACTS:

- Canine vision is adapted for crepuscular hunting.
- Their retinas feature a high ratio of rod photoreceptors to cone photoreceptors (20:1), paired with a reflective tapetum lucidum layer containing zinc cysteine crystals, enhancing low-light motion detection by 40%.

MOTION DETECTING CANINE

#2

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WIKI SIDE

HONEYBEE

Honeybee (*Apis mellifera*)



animalvision://4

OPTICAL SPECS:

SPECTRAL BAND:

300 nm (Ultraviolet) to 650 nm (Red-blind).

LIGHT SENSITIVITY:

Sensitive to UV flower bullseye patterns and skylight polarization angles.

FIELD OF VIEW:
180° Panoramic Span

RETINA & OPTICS:

Honeybees have compound apposition eyes composed of 5,000 ommatidia lenses with UV, blue, and green photoreceptors (Peitsch et al., 1992; Menzel & Blakers, 1976).

SIMULATION:

Hexagonal ommatidia compound matrix with neon purple UV floral guide highlights and red-blind color shifting.

NECTAR GUIDE NAVIGATOR

#4

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VISION SIDE

GOLDEN EAGLE

Golden Eagle (*Aquila chrysaetos*)



animalvision://6

OPTICAL SPECS:

SPECTRAL BAND:

370 nm (UV-A) to 750 nm (Broad Spectrum).

LIGHT SENSITIVITY:

High contrast foveal zoom with yellow oil droplet filters that reduce sky glare.

FIELD OF VIEW:
180° Panoramic Span

RETINA & OPTICS:

Golden Eagles possess tetrachromatic vision with two foveae per eye, providing approximately 2.3x to 3x standard human daylight acuity (140 CPD resolving power; Raymond, 1985).

SIMULATION:

Central foveal telescopic magnification (up to 2.2x zoom) with high-contrast amber sky tuning and sharp prey edge outlines.

DUAL FOVEA RESOLUTION

#6

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VISION SIDE

PRO SPECIES SNEAK PEEK

Snake (PIT VIPER)

Crotalinae



THERMAL HEAT PIT ORGAN

Detects invisible infrared thermal heat emissions from warm-blooded prey in total darkness.

UNLOCK IN PRO APP • 24 MORE SPECIES

praveenojha.com/animalvision

PRO SPECIES SNEAK PEEK

BAT

Microchiroptera



ACOUSTIC ULTRASONIC SONAR

Uses device microphone to generate real-time 3D acoustic echo wavefronts.

UNLOCK IN PRO APP • 24 MORE SPECIES

praveenojha.com/animalvision

GOLDEN EAGLE

Golden Eagle (*Aquila chrysaetos*)

VISION & SENSES



VISION & SENSES WIKI



ECOLOGY & SPECIES WIKI FACTS:

- *Aquila chrysaetos* retinas contain 1 million cone photoreceptors per mm² (6x human density) across two distinct foveae (deep central and shallow temporal).
- Yellow oil droplets filter blue sky haze, enabling eagles to spot rabbits moving 3 kilometers away while soaring.

APEX SKY SCANNER

#6

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WIKI SIDE

HONEYBEE

Honeybee (*Apis mellifera*)

VISION & SENSES



VISION & SENSES WIKI



ECOLOGY & SPECIES WIKI FACTS:

- *Apis mellifera* compound eyes feature 5,000 hexagonal ommatidia units.
- Bees perceive ultraviolet light (300–400 nm), revealing invisible 'bullseye' nectar guide patterns on flower petals that attract pollinators.

OMMATIDIA MOSAIC PATTERN

#4

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WIKI SIDE

COMPLETE ADVENTURE BOX BAT ACOUSTIC SONAR

Microchiroptera (Pro Species)



SCAN TO UNLOCK FULL 32-CARD DECK

Experience Pit Viper thermal infrared, Bat ultrasonic sonar, Great White Shark electroreception and 21 more incredible creatures!

LIFETIME PASS AVAILABLE ONLINE

COMPLETE ADVENTURE BOX SNAKE THERMAL INFRARED

Crotalinae (Pro Species)



SCAN TO UNLOCK FULL 32-CARD DECK

Experience Pit Viper thermal infrared, Bat ultrasonic sonar, Great White Shark electroreception and 21 more incredible creatures!

LIFETIME PASS AVAILABLE ONLINE

SECTION III

Teacher Lesson Plan & Educator Guide

Structured classroom optics lessons, inquiry prompts, NGSS alignment, and science station guides.

CLASSROOM EDITION • TEACHER COMPANION

TEACHER GUIDE & ACTIVITY KIT

ANIMAL VISION ADVENTURE BOX

Companion to STEM Book, 32 Trading Cards, A2 Wall Poster & Digital Pass

01

STEM Book
Field Atlas

02

32 Cards
QR Unlock

03

This Guide
Lessons & Labs

04

Wall Poster
A2 Spectrum

05

Digital Pass
Activation Key

Animal Vision Adventure Box

Explore 30+ Biological Vision

DESIGN & CREATIVE TEAM
Praveen Ojha & Anshika Dixit

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SECTION 1: TEACHER'S GUIDE & EXECUTIVE OVERVIEW

Low-prep classroom integration, encrypted QR unlocking, and child safety settings.

Section 1 Overview: Quick Start (Pg 4) • Objectives & NGSS Standards (Pg 5)

UNIT GUIDE

CLASSROOM KIT COMPONENTS

STEM Book & Field Atlas

Full optical atlas & biological vision reference.

32 STEM Trading Cards

Guarded encrypted QR unlock codes for 30+ species.

A2 Wall Poster

Printable A2 bio-optics spectrum classroom poster.

Animal Vision App

Real-time GLSL/Metal shader emulation engine.

Digital Companion Pass

Encrypted teacher activation pass & license.

Activity Worksheets

Printable observation logs, matrices & labs.

RECOMMENDED CLASSROOM DEPLOYMENT OPTIONS

Option A — Teacher Station:

Project app screen to class while scanning central cards.

Option B — Small Groups:

Teams share 2–4 devices for hands-on STEM sensor labs.

Option C — 1:1 Exploration:

Individual devices for self-paced spectral comparison.

CLASSROOM TIME BUDGET (45-MINUTE LESSON STANDARD)

5 Min
Warm-up Intro

15 Min
App Exploration

15 Min
Worksheet Lab

10 Min
Class Reflection

TEACHER PRE-FLIGHT SETUP CHECKLIST

- 1. Install App:** Download on iOS App Store or Google Play.
- 3. Set Security PIN:** Lock app settings behind 4-digit PIN.

- 2. Test Scanner:** Scan Trading Card #01 to test camera.
- 4. Print Labs:** Print Student Activity Sheets from kit.

CHILD SAFETY & ENCRYPTED QR PROTECTION

Animal Vision is engineered with strict, multi-layered child safety controls to guarantee a safe, focused learning environment free of external browsing risks:

- Guarded Encrypted QR Links:** Every link on our official trading cards is guarded by encryption, and only our official app accepts these secure links. All external or unapproved QR codes are instantly rejected, ensuring the cards are completely safe.
- Locked In-App Reader:** Educational reference content opens exclusively inside a sandboxed, locked reader. The app will never let students navigate out of the app or browse external, unverified websites.
- Teacher PIN Security Lock:** Access to camera modes, settings, and safety configurations can be locked behind a 4-digit PIN for total classroom control.

CORE EDUCATIONAL PILLARS

- 1

Retinal Photoreceptor Spectral Sensitivity:
Explain how different retinas process light spectrums compared to human adults (3 cones, 400-700nm) and human infants.
- 2

Color Perception & Wavelength Shifts (λ_{max}):
Compare dichromatic (dog/cat) red-blind vision vs trichromatic (human) and tetrachromatic (bird/bee) UV perception.
- 3

Specialized Sensory Adaptations:
Analyze echolocation (bat/dolphin), geomagnetic navigation (pigeon), thermal IR (pit viper), and dual 2-FOV turrets (chameleon).
- 4

Hardware Sensor Data Logging:
Conduct real smartphone sensor experiments tracking microphone decibels, magnetometer microTesla (μT), and tilt angles.
- 5

Bio-Inspired Biomimicry Engineering:
Apply animal optical mechanisms to design human technology (submarine sonar, infrared cameras, and drone vision).

 BLOOM'S TAXONOMY COGNITIVE LEVELS

- 1. Remember & Identify:**
Name photoreceptor types (rods vs cones) & species spectrum limits.
- 2. Analyze & Compare:**
Contrast dichromatic vs trichromatic spectrum graphs & λ_{max} peaks.
- 3. Evaluate & Create:**
Design bio-inspired technology applications solving human challenges.

NGSS SCIENCE & STEM STANDARDS ALIGNMENT

Standard	Core Concept	App Integration
NGSS LS1.D	Information Processing & Sensory Perception	Cone photoreceptor & rod light gain model
NGSS PS4.B	Electromagnetic Radiation & Light Absorption	UV floral bullseye & thermal IR spectrum
NGSS ETS1.A	Bio-Inspired Engineering Design Solutions	Submarine sonar & camera drone zoom design
MS-LS1-8	Sensory Receptors & Signal Transmission	Magnetometer compass & acoustic pulse rings

Lesson 1: Free Exploration & Discovery (30–40 min)

LESSON OBJECTIVE

Students freely scan Trading Cards using the Auto QR Scanner to explore animal vision models across terrestrial, aerial, and aquatic species.

MATERIALS NEEDED

- STEM Trading Cards (distributed to student groups)
- Devices with the Animal Vision app installed
- Observation Log worksheet (Worksheet 1)

STEP-BY-STEP LESSON FLOW

- | | |
|--------------------------------|---|
| 1. Introduce Senses (5 min): | Discuss how human vision differs from animal vision across land, air, and water environments. |
| 2. Scanner Demo (3 min): | Demonstrate scanning a trading card using the instant Auto QR Scanner. |
| 3. Group Exploration (20 min): | Students work in pairs, scanning cards and recording observations on Worksheet 1. |
| 4. Class Share (7 min): | Ask: "Which animal vision surprised you most and why?" |

DIFFERENTIATION & ACCOMMODATIONS TIP

For English Language Learners (ELL): Enable the visual icon overlays in the app settings to show cone photoreceptor icons alongside species names.

For Advanced Students: Challenge students to calculate the percentage shift in visible light spectrum wavelength (λ_{max}) between human trichromacy (400-700nm) and honeybee UV (300-650nm).

CLASSROOM DISCUSSION PROMPTS

- What primary colours disappeared or shifted when switching between Dichromatic (Dog/Cat) and Trichromatic (Human) vision?
- Which animal species exhibited the highest light sensitivity in low-light environments?
- How does the Honeybee's UV Bullseye pattern help it locate floral nectar?

Lesson 2: Guided Photoreceptor Comparison (40–45 min)

LESSON OBJECTIVE

Students compare peak wavelengths (λ_{max}), cone photoreceptors, and retinal adaptations across species pairs.

MATERIALS NEEDED

- Selected Trading Cards & Field Guide pages
- Devices with Animal Vision app
- Compare & Contrast worksheet (Worksheet 2)

STEP-BY-STEP LESSON FLOW

- | | |
|-----------------------------------|---|
| 1. Pair Selection (5 min): | Teacher assigns species pairs (e.g. Eagle vs Owl, Honeybee vs Human, Pit Viper vs Rattlesnake). |
| 2. Camera Comparator (10 min): | Students switch between vision modes on live classroom objects. |
| 3. Data Logging (15 min): | Students complete Worksheet 2, comparing λ_{max} values and cone counts. |
| 4. Synthesis Discussion (10 min): | Groups analyze differences in visual acuity and night gain. |

 **RECOMMENDED SPECIES COMPARISON PAIRS**

• Eagle vs Owl: Dual Fovea Zoom vs Tapetum Lucidum Low-Light Gain.	• Human vs Dog: Trichromatic Color vs Dichromatic Red-Blindness.
• Honeybee vs Pit Viper: Ultraviolet Bullseye vs Thermal Infrared Sensor.	• Shark vs Dolphin: Monochromatic Blue Shift vs Acoustic Echolocation.

CLASSROOM DISCUSSION PROMPTS

- Comparing the Eagle's dual fovea to the Owl's tapetum lucidum, which adaptation gives greater advantage in daylight vs nocturnal hunting?
- How do peak spectral sensitivity wavelengths (λ_{max}) explain why marine species like Sharks & Dolphins are tuned to blue-green light (470-490nm)?

Lesson 3: Station Rotation & Hardware Sensor Exploration (45–60 min)

LESSON OBJECTIVE

Students rotate through 4 hardware sensory stations (Echolocation, Magnetometer, Dual 2-FOV, Thermal IR).

LESSON OBJECTIVE

Students rotate through 4 hardware sensory stations (Echolocation, Magnetometer, Dual 2-FOV, Thermal IR).

MATERIALS NEEDED

- 4 designated classroom tables with Trading Cards
- 3–4 devices with live sensor features enabled (Microphone, Magnetometer, Gyroscope)
- Hardware Sensor Activity sheets (Labs 1, 2, 3, 4)

STATION SETUP & FLOW

- Station A:** **Bat & Dolphin Echolocation:** Microphone decibel tracking & silence darkness test.
- Station B:** **Chameleon 2-FOV Turret:** Gyroscope perspective pan & sound focus-lock.
- Station C:** **Homing Pigeon Compass:** Magnetometer North-to-South geomagnetic rotation test.
- Station D:** **Frog & Pit Viper Optics:** Motion-triggered yellow bug detector & thermal infrared mapping.

HARDWARE SENSOR MANAGEMENT TIP

Ensure device microphone permissions are granted before starting Station A. For Station C (Homing Pigeon), keep devices away from large metal desks or laptop chargers to prevent magnetic interference with the smartphone magnetometer sensor (μT).

HARDWARE SENSOR MANAGEMENT TIP

Ensure device microphone permissions are granted before starting Station A. For Station C (Homing Pigeon), keep devices away from large metal desks or laptop chargers to prevent magnetic interference with the smartphone magnetometer sensor (μT).

CLASSROOM DISCUSSION PROMPTS

- How does the Homing Pigeon combine polarized sky compasses with Earth's 3D geomagnetic force lines?
- Why do Bats and Dolphins emit acoustic sonar sound waves instead of relying solely on visual light?

- CLASSROOM DISCUSSION PROMPTS**

 - How does the Homing Pigeon combine polarized sky compasses with Earth's 3D geomagnetic force lines?
 - Why do Bats and Dolphins emit acoustic sonar sound waves instead of relying solely on visual light?

SECTION IV

Student Activity Sheets & Hands-on Labs

Observation logs, thermal lab experiments, optical adaptation matching game, and award certificate.

Worksheet 1 — Comparative Vision Observation Log

Name: _____ Date: _____ Group: _____

Select 4 different animals in the Animal Vision app. Switch between Human Vision and Animal Vision for each animal, observe live camera changes, and fill in the observations below:

Animal Name	Vision Type	Color & Wavelength Changes	Clarity & Special Overlays
1.			
2.			
3.			
4.			

Reflection: Which animal's vision surprised you the most, and why?

Worksheet 4 — My Favourite Vision Drawing Log

Name: _____ Date: _____ Group: _____

Draw a classroom scene as seen through your chosen animal's eyes!

Animal Chosen: _____ Vision Type: _____

Color Palette Used:

Focus & Clarity:

Special Overlay:

Why would this vision help this animal survive in the wild?

 PIT VIPER LOREAL PIT THERMAL IR SENSOR LAB

SPECIES CODE #6 • THERMAL SHADER

Loreal pit organs detect long-wave thermal infrared radiation (7,000–14,000nm), mapping warm bodies as glowing red/yellow signatures on cool blue backgrounds!

 CLASSROOM ACTIVITY: THERMAL IR HEAT-SIGNATURE TRACING

- Step 1:** Select Pit Viper mode (#6) and aim the camera at warm classroom objects (hands, laptops) vs cool surfaces.
- Step 2:** Observe how warm objects emit vivid red/orange thermal glows even in dark environments!

 STUDENT STEM REFLECTION LOG — THERMAL IR HEAT TRACING

1. Loreal Pit Thermal Organ: How do pit vipers detect warm-blooded prey in complete pitch-black darkness without relying on visible light?

2. Thermal Wavelength Spectrum: What thermal colors represent the hottest vs coolest objects on your camera viewport?

3. Firefighting & Night-Vision Bio-Tech: How do firefighters or search-and-rescue teams use thermal imaging technology inspired by pit vipers?

PART B: MATCH THE ANIMAL TO ITS OPTICAL ADAPTATION (SET 1 & SET 2)

Write the matching letter (A–F) in the blank next to each numbered species:

Set 1: Terrestrial & Aquatic Species

- ___ 1. Domestic Dog
- ___ 2. Pit Viper
- ___ 3. Microbat
- ___ 4. Chameleon
- ___ 5. Deep-Sea Shark
- ___ 6. Tree Frog

-
- A) Loreal Pit Thermal Heat IR
 - B) 360° Independent Eye Turrets
 - C) Dichromatic Red-Cone Deficiency
 - D) High-Frequency Ultrasonic Sonar
 - E) Motion-Triggered Retinal Highlight
 - F) Monochromatic Blue Shift (~480nm)

Set 2: Aerial & Specialized Species

- ___ 1. Honeybee
- ___ 2. Homing Pigeon
- ___ 3. Hunting Eagle
- ___ 4. Nocturnal Owl
- ___ 5. Human Infant
- ___ 6. Goldfish

-
- A) Cryptochrome 4 Sky Magnetometer
 - B) Dual Fovea Telephoto Magnification
 - C) Ultraviolet (300-400nm) Nectar Guides
 - D) Tetrachromatic (UV, Visible & IR) Spectrum
 - E) Tapetum Lucidum Low-Light Gain
 - F) Low Spatial Contrast Acuity

PART C: SHORT ANSWER REFLECTIONS (10 QUESTIONS)

Answer each question concisely in 1–2 complete sentences:

1. Explain how tapetum lucidum enhances night vision in nocturnal predators like cats & owls.

2. Why do honeybees see ultraviolet nectar guide bullseyes on flower petals?

3. How do microbats navigate and catch insects in total darkness using echolocation?

4. What is the biological advantage of an eagle possessing two distinct foveas in each eye?

5. How do pit vipers hunt warm-blooded mice in dark burrows using thermal IR sensors?

6. Describe how smartphone microphone sensors simulate acoustic sonar wave pulse rings in the app.

7. What component in avian retinas allows homing pigeons to detect Earth's geomagnetic fields?

8. Why does a tree frog's retina react primarily to sudden motion rather than still backgrounds?

9. How does human trichromatic vision (RGB) compare with dog dichromatic vision?

10. Give one real-world bio-inspired technology inspired by animal sensory vision systems.

EASY PRINT & CUTOUT CERTIFICATE FOR STUDENTS

Cut along dashed line below • Standard A4 / Letter Print Ready



OFFICIAL JUNIOR BIO-OPTICS BADGE

NATIONAL STEM CURRICULUM ACHIEVEMENT AWARD

JUNIOR BIO-OPTICAL EXPLORER

This official STEM award is proudly presented to student explorer:

Student Full Name

For successfully mastering all **30 Vision Modes** of the Animal Vision STEM Laboratory Unit, demonstrating scientific excellence in comparative optics, wavelength mechanics, and bio-inspired engineering.



Dichromacy
2-Cone Color



Echolocation
Sonar Echoes



2-FOV Turrets
Split Vision



Magneto
Sky Compass



Thermal IR
Heat Signatures

Teacher / Educator Signature

Date Awarded

ANIMAL VISION ADVENTURE BOX • APP: [WEBCAMFX.COM/ANIMAL-VISION](https://webcamfx.com/animal-vision)

Upgrade to the Complete 30–Animal Pack

Enjoyed the 6 starter animals? The full edition expands to 30 extraordinary species, including deep sea predators, nocturnal raptors, and mythical creature bonus modes!

Feature / Resource	Free Demo	Complete 30–Pack
Total Species Simulated	6 Animals	30 Animals + 2 Mythical
Printable AR QR Trading Cards	6 Cards	30 Full Collectible Cards
Illustrated STEM Field Guide	20 Pages	104 Full Color Pages
Teacher Curriculum Guide	3 Lessons (Sample)	32 Pages Complete Curriculum
Student Worksheets & Labs	4 Worksheets	14 Worksheets + Quizzes
Giant A2 Classroom Wall Poster	Preview only	Print–Ready High–Res Poster

Upgrade to the Full 30–Animal Edition

Includes the complete 104–page book, 30 collectible AR cards, and full 32–page classroom curriculum.

praveenajha.com/animalvision

Thank You for Exploring Animal Vision!

Dear Parents, Teachers, and Curious Explorers,

I created **Animal Vision STEM** because I believe that the best learning happens when curiosity meets hands-on discovery. When children look through the eyes of a honeybee seeing ultraviolet landing runways on flower petals, or a bat echolocating in total darkness, science stops being a textbook diagram and becomes an unforgettable adventure.

I hope this 6-animal starter pack sparks wonderful discussions in your home or classroom. If you have any feedback, questions, or ideas for new animal simulations, please reach out directly!

With warmest regards,

Praveen Ojha

Founder, Induction Games & Animal Vision STEM



Visit Animal Vision Online

Explore live simulators, printable downloads & support:

praveenojha.com/animalvision →