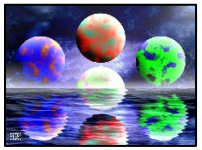
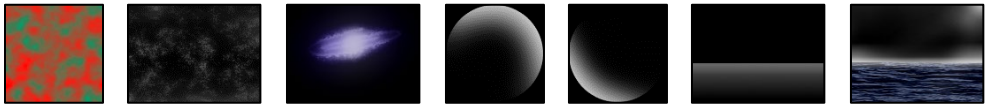
# Gabriel Gates

Completed



Originals



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# Name: Gabriel Gates
# Date: October 23, 2026
# Revised: November 7, 2026

from mediaComp import *

def collage():
    canvas = makeEmptyPicture(1000, 736, white)
    planet = makePicture(getMediaFolder("planet.png"))
    background = scaleToSize(planet, 1000, 736)
    increaseContrast(background, 4.0)
    darken(background)
    cyanotype(background)
    copyPicture(background, canvas, 0, 0)
    overlay = makePicture(getMediaFolder("bgoverlay.png"))
    addPicture(overlay, canvas, 0, 0)
    increaseContrast(canvas, 1.5)
    galaxy = makePicture(getMediaFolder("galaxyoverlay.png"))
    addPicture(galaxy, canvas, 0, 0)
    light_shading = scaleToSize(makePicture(getMediaFolder("planetAdditive.png")), 260, 260)
    dark_shading = scaleToSize(makePicture(getMediaFolder("planetSubtractive.png")), 260, 260)
    drawPlanet(canvas, planet, light_shading, dark_shading, 55, 163, 1, 2.0, True)
    drawPlanet(canvas, planet, light_shading, dark_shading, 370, 43, 0, 1.0, False)
    drawPlanet(canvas, planet, light_shading, dark_shading, 370, 323, 3, 0.6, False)
    drawPlanet(canvas, planet, light_shading, dark_shading, 685, 163, 2, 3.0, False)
    reflection = makeReflection(canvas, 438)
    reflection = waveWater(reflection, 10, 2)
    reflection = blur(reflection, 3)
    copyPicture(reflection, canvas, 0, 438)
    sea_darken = makePicture(getMediaFolder("seaDarken.png"))
    subtractPicture(sea_darken, canvas, 0, 0)
    sea = makePicture(getMediaFolder("seaOverlay.png"))
    addPicture(sea, canvas, 0, 0)
    signature = makePicture(getMediaFolder("signature.png"))
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    reverseChromakey(signature, canvas, 25, 664)
    show(canvas)

def reverseChromakey(signature, target, posX, posY):
    for x in range(0, getWidth(signature)):
        for y in range(0, getHeight(signature)):
            signaturePixel = getPixelAt(signature, x, y)
            brightness = (getRed(signaturePixel) + getGreen(signaturePixel) + getBlue(signaturePixel)) // 3
            if brightness < 200:
                targetPixel = getPixelAt(target, x + posX, y + posY)
                setColor(targetPixel, white)

def makeReflection(source, mirror_y):
    reflection_height = getHeight(source) - mirror_y
    reflection = makeEmptyPicture(getWidth(source), reflection_height)
    for x in range(0, getWidth(source)):
        for y in range(0, reflection_height):
            sourcePixel = getPixelAt(source, x, mirror_y - 1 - y)
            setColor(getPixelAt(reflection, x, y), getColor(sourcePixel))
    return reflection

def waveWater(picture, wave_rows, shift_per_row):
    width = getWidth(picture)
    wavy = makeEmptyPicture(width, getHeight(picture))
    for y in range(0, getHeight(picture)):
        position = y % (wave_rows * 2)
        if position < wave_rows:
            shift = position * shift_per_row
        else:
            shift = (wave_rows * 2 - position) * shift_per_row
        for x in range(0, width):
            source_x = (x - shift) % width
            setColor(getPixelAt(wavy, x, y), getColor(getPixelAt(picture, source_x, y)))
    return wavy

def blur(picture, passes):
    blur_picture = duplicatePicture(picture)
    for i in range(passes):
        previous = duplicatePicture(blur_picture)
        for x in range(1, getWidth(picture) - 1):
            for y in range(1, getHeight(picture) - 1):
                center = getPixelAt(blur_picture, x, y)
                left = getPixelAt(previous, x - 1, y)
                right = getPixelAt(previous, x + 1, y)
                top = getPixelAt(previous, x, y - 1)
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                bottom = getPixelAt(previous, x, y + 1)
                middle = getPixelAt(previous, x, y)
                new_red = (getRed(middle) + getRed(left) + getRed(right) + getRed(top) + getRed(bottom)) // 5
                new_green = (getGreen(middle) + getGreen(left) + getGreen(right) + getGreen(top) +
                             getGreen(bottom)) // 5
                new_blue = (getBlue(middle) + getBlue(left) + getBlue(right) + getBlue(top)+ getBlue(bottom)) // 5
                setColor(center, makeColor(new_red, new_green, new_blue))
    return blur_picture

def drawPlanet(canvas, planet, light_shading, dark_shading, posX, posY, hue_shift, contrast, rotate):
    planet_picture = scaleToSize(planet, 260, 260)
    if rotate:
        planet_picture = rotate90(planet_picture)
    shiftHue(planet_picture, hue_shift)
    increaseContrast(planet_picture, contrast)
    addPicture(light_shading, planet_picture, 0, 0)
    subtractPicture(dark_shading, planet_picture, 0, 0)
    copyCircle(planet_picture, canvas, posX, posY)

def copyCircle(source, target, posX, posY):
    radius = getWidth(source) // 2
    center_x = getWidth(source) // 2
    center_y = getHeight(source) // 2
    for x in range(0, getWidth(source)):
        for y in range(0, getHeight(source)):
            dx = x - center_x
            dy = y - center_y
            if dx * dx + dy * dy <= radius * radius:
                sourcePixel = getPixelAt(source, x, y)
                targetPixel = getPixelAt(target, x + posX, y + posY)
                setColor(targetPixel, getColor(sourcePixel))

def scaleToSize(source, new_width, new_height):
    result = makeEmptyPicture(new_width, new_height)
    x_ratio = getWidth(source) / new_width
    y_ratio = getHeight(source) / new_height
    for x in range(0, new_width):
        for y in range(0, new_height):
            source_pixel = getPixelAt(source, int(x * x_ratio), int(y * y_ratio))
            setColor(getPixelAt(result, x, y), getColor(source_pixel))
    return result

def copyPicture(source, target, posX, posY):
    for x in range(0, getWidth(source)):
        for y in range(0, getHeight(source)):
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            sourcePixel = getPixelAt(source, x, y)
            targetPixel = getPixelAt(target, x + posX, y + posY)
            setColor(targetPixel, getColor(sourcePixel))

def subtractPicture(source, target, posX, posY):
    for x in range(0, getWidth(source)):
        for y in range(0, getHeight(source)):
            sourcePixel = getPixelAt(source, x, y)
            targetPixel = getPixelAt(target, x + posX, y + posY)
            new_red = clampChannel(getRed(targetPixel) - getRed(sourcePixel))
            new_green = clampChannel(getGreen(targetPixel) - getGreen(sourcePixel))
            new_blue = clampChannel(getBlue(targetPixel) - getBlue(sourcePixel))
            setColor(targetPixel, makeColor(new_red, new_green, new_blue))

def clampChannel(value):
    if value < 0:
        return 0
    if value > 255:
        return 255
    return value

def addPicture(source, target, posX, posY):
    for x in range(0, getWidth(source)):
        for y in range(0, getHeight(source)):
            sourcePixel = getPixelAt(source, x, y)
            targetPixel = getPixelAt(target, x + posX, y + posY)
            new_red = clampChannel(getRed(targetPixel) + getRed(sourcePixel))
            new_green = clampChannel(getGreen(targetPixel) + getGreen(sourcePixel))
            new_blue = clampChannel(getBlue(targetPixel) + getBlue(sourcePixel))
            setColor(targetPixel, makeColor(new_red, new_green, new_blue))

def rotate90(picture):
    width = getWidth(picture)
    height = getHeight(picture)
    rotated = makeEmptyPicture(height, width)
    for x in range(0, width):
        for y in range(0, height):
            sourcePixel = getPixelAt(picture, x, y)
            targetPixel = getPixelAt(rotated, height - 1 - y, x)
            setColor(targetPixel, getColor(sourcePixel))
    return rotated

def shiftHue(picture, shift_type):
    for pixel in getPixels(picture):
        old_red = getRed(pixel)
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        old_green = getGreen(pixel)
        old_blue = getBlue(pixel)
        if shift_type == 1:
            setColor(pixel, makeColor(old_green, old_blue, old_red))
        elif shift_type == 2:
            setColor(pixel, makeColor(old_blue, old_red, old_green))
        elif shift_type == 3:
            setColor(pixel, makeColor(old_green, old_red, old_blue))
        elif shift_type == 4:
            setColor(pixel, makeColor(old_blue, old_green, old_red))

def stretchChannel(value, factor):
    new_value = int((value - 128) * factor + 128)
    return clampChannel(new_value)

def increaseContrast(picture, factor):
    for pixel in getPixels(picture):
        new_red = stretchChannel(getRed(pixel), factor)
        new_green = stretchChannel(getGreen(pixel), factor)
        new_blue = stretchChannel(getBlue(pixel), factor)
        setColor(pixel, makeColor(new_red, new_green, new_blue))

def darken(picture):
    for pixel in getPixels(picture):
        setColor(pixel, makeDarker(getColor(pixel)))

def cyanotype(picture):
    for pixel in getPixels(picture):
        intensity = int(getRed(pixel) * 0.299 + getGreen(pixel) * 0.587 + getBlue(pixel) * 0.114)
        setColor(pixel, makeColor(intensity // 4, intensity // 2, intensity))
```