Lesson Plan: The Secret Science of Color - Painting in 3D

Subject: Art and Science

Age Group: 8-10 years (Designed for a 9-year-old)

Time Allotment: 60-90 minutes

Materials Needed

- A small, paintable 3D object (e.g., smooth rock, small wooden box, unpainted toy figure, cardboard shape)
- Acrylic paints: Red, Yellow, Blue, White, and Black
- Paint palette or a paper plate
- Paintbrushes in various sizes
- Cup of water for rinsing brushes
- Paper towels for blotting brushes
- Scrap paper or a sketchbook for color mixing practice
- Protective covering for the work surface (newspaper, plastic tablecloth)
- Optional: Apron or old shirt

Learning Objectives

By the end of this lesson, you will be able to:

- Mix secondary colors (orange, green, purple) from primary colors (red, yellow, blue).
- Define and create tints, shades, and tones by adding white, black, or gray.
- Apply your mixed colors to a 3D object to create highlights and shadows.
- Explain how adding white, black, or gray changes a color's "mood" or "value."

Lesson Structure

Part 1: Introduction - The Color Challenge (10 minutes)

Hook

Ask the learner: "If you only had red, yellow, and blue paint, could you paint a picture of a forest at sunset? What about the bright, sunny spots? What about the dark shadows behind the trees? Today, we're going to become Color Scientists and discover the secret recipes that artists use to make every color imaginable, and then we'll use that magic to bring a 3D object to life!"

State Objectives in Kid-Friendly Language

"Our mission today is to:

1. Become master color mixers.

2. Learn the secret codes: 'tints' for light colors, 'shades' for dark colors, and 'tones' for muted, grayish colors.
3. Use our new color powers to paint a cool 3D object and make it look realistic with highlights and shadows."

Part 2: The Body - The Color Science Lab (40-60 minutes)

I Do: The Secret Formulas (10 minutes)

Educator demonstrates and explains.

1. **Review Primary & Secondary Colors:** "You already know the super-powered primary colors: Red, Yellow, and Blue. Let's quickly mix their 'children,' the secondary colors." On the palette, mix: Red + Yellow = Orange; Yellow + Blue = Green; Blue + Red = Purple.
2. **Introduce the "Secret Ingredients":** "Now for the secret science! We have two special ingredients: White and Black. They don't change the color, they change its *value*, which is just a fancy word for how light or dark it is."
3. **Demonstrate Tints:** "When we add white to a color, we make a **TINT**. Think 'tiny bit of white.' It's like shining a flashlight on the color. It gets lighter and brighter." Mix a little white into red to make pink.
4. **Demonstrate Shades:** "When we add black to a color, we make a **SHADE**. Think 'shadows.' It’s like pulling a color into a dark room. It gets darker." Mix a tiny bit of black into red to make a dark crimson. (Warn: "Black is very powerful, so you only need a tiny drop!")
5. **Demonstrate Tones:** "This is the expert-level secret! What happens if we mix white AND black together? We get gray! When we add gray to a color, we create a **TONE**. It makes the color more muted, dusty, or calm. It's like seeing a color on a foggy day." Mix a little gray into red to make a dusty rose.

We Do: Color Mixing Practice (10 minutes)

Learner practices with guidance.

"Now it's your turn to be the scientist! On your practice paper, let's create our own color recipes."

- "Let's make a **tint** together. Pick a color, maybe blue. Now, slowly add tiny bits of white. See how many different light blues you can make! This is perfect for painting a sunny sky."
- "Great! Now for a **shade**. Let's take green. Add the tiniest speck of black. See how it becomes a deep forest green? This is what you'd use for shadows under a leaf."
- "Time for the expert **tone**! Mix a little black and white to make gray. Now, add a little bit of that gray to your purple. It's not just light or dark, it's... different, right? More mysterious. This is great for painting stormy clouds or distant mountains."

Formative Assessment: Ask questions during this phase. "What will happen if you add more white?" "Which color would you use for a shadow?" "What's the difference between a shade and a tone?"

You Do: Painting the 3D Object (20-40 minutes)

Learner works independently.

"You are now a certified Color Scientist! Choose your 3D object. Your mission is to paint it using what

we've learned. You don't have to use every color, but your painting must include:

- At least one **base color** (a pure color like red or a mixed one like green).
- At least one **tint** you mixed yourself to show where light is hitting your object (a highlight).
- At least one **shade** you mixed yourself to show where there are shadows.

Think about a pretend light source. Where would the light be shining from? That's where your light tints will go. The opposite side is where your dark shades will be."

Part 3: Conclusion - The Art Show (10 minutes)

Recap and Share

"Let's have a mini art show! Tell me about your creation."

- Have the learner present their painted object.
- Ask them to point out: "Where did you use a tint? Where did you use a shade? Why did you put them there?"
- "What was the most surprising color you mixed today?"

Reinforce Key Takeaways

"Today we learned that artists are also scientists! We don't need a million paints to make a million colors. With just red, yellow, blue, black, and white, you can create bright highlights (tints), deep shadows (shades), and everything in between. You now have the power to make your art look more realistic and 3D just by mixing colors!"

Assessment

- **Formative (During Lesson):** Observe the learner's ability to mix tints and shades during the "We Do" phase. Listen to their answers to probing questions.
- **Summative (End of Lesson):** The finished 3D painted object serves as the summative assessment.

Success Criteria ("What Success Looks Like"):

- The learner correctly mixed and used a lighter tint on their object to represent a highlight.
- The learner correctly mixed and used a darker shade on their object to represent a shadow.
- The paint is applied with reasonable care to the object.
- The learner can verbally explain that adding white makes a tint and adding black makes a shade.

Differentiation and Adaptability

- **For Younger Learners or Scaffolding:** Focus only on tints and shades, leaving tones for a future lesson. Pre-mix the gray for them if needed. Use a very simple object like a smooth, round rock.
- **For Advanced Learners (Extension):** Challenge them to also incorporate a **tone** into their project. Introduce complementary colors (opposites on the color wheel, like red/green) and have

them mix a small amount of a color's complement to create a more natural-looking shadow than just using black. They could also try painting a whole scene on their object (e.g., a landscape on a box) using tints, shades, and tones.

- **Classroom/Group Adaptation:** The "I Do" can be a demonstration for the whole class. The "We Do" can be done in pairs (Think-Pair-Share on what they discovered). The "You Do" remains individual work, and the final "Art Show" becomes a gallery walk where students can view each other's work.