

## Santa Barbara County APCD Clean Air Ambassadors, Lesson 3 *Why is Coco Orange?* – Sensors and Our Health

### California Science Content:

**K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

**K-ESS2-1.** Use and share observations of local weather conditions to describe patterns over time.

**K-ESS3-2.** Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather

**K-2-ETS1-1.** Before beginning to design a solution, it is important to clearly understand the problem.

**1-PS4-4.** Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.

**Grade:** K-1<sup>st</sup>

**Objectives:** To demonstrate how the Air Quality Index is used to communicate air quality conditions. To inform students how to interpret the Air Quality Index Chart and learn how we can protect our health against air pollution, specifically particulate matter and ozone. To discuss how low-cost sensors collect local air quality data.

### Materials:

- [\*Why is Coco Orange?\*](#) Book
- Laminated Fire & Smoke maps with scripts on back
- PurpleAir Low-Cost Sensor
- Air Quality Index (AQI) color code chart and cards
- Air Quality Index Magnets (1 for each student)
- Thank you note + magnet for the teacher!
- Classroom Daily AQI tracker (1 per classroom)
- Coco Says Game Rules
- Coloring Page Activity (1 for each student)

### Introduction:

- Hi friends! How's everyone doing? We are so excited to be back in your classroom. Are you having a good day so far? Awesome, it is about to get even better! Just to remind you, my name is \_\_\_\_\_ and these are my friends \_\_\_\_\_ and \_\_\_\_\_.

- Over the past two weeks, we learned a lot about clean air! We saw how pollution can hurt the places animals live—like in *The Lorax*. We also learned how filters help keep all the yucky stuff out of our lungs. Today, we’re here to show you how different colors can tell us how dirty the air is—and talk about how we can stay safe when the air is not so good!
- Now, we are going to read a fun story about different levels of dirty air and what we can do to stay healthy when our air is dirty. The story is called *Why is Coco Orange?*
- While we read this story, we will have our chameleon friend here, Coco! Everyone say, ‘Hi Coco’? Be careful, Coco’s ears will hurt, if you talk while we read the story and Coco might get sad and lose color!
- Before we start the story, can we all reach up high in the air for that special listening key? (demonstrate reaching into the air and grabbing an imaginary key) Great! Let’s unlock our right ear, and now our left ear, and now let’s put the key back in its hiding spot! Now reach your hands high into the sky and now plant those hands right in your lap.
- (Demonstrate doing this, slowly, making eye contact with the kids who don’t catch on right away.)
- Great! Keep those listening ears wide open so that Coco doesn’t get sad!

**Procedure:**

1. **Have two Ambassadors read “Why is Coco Orange?” and pause on the following pages:**
  - Page 5:
    - “Asthma can make your lungs feel yucky from dirty air. That’s why we need clean air!”
  - Page 15:
    - “When the dirty air mixes with the sun on a hot day it makes something called ozone. When it’s up high it can protect us from the Sun’s heat, but when it comes to close to the Earth it can create pollution and make us feel sick. We can remember by saying: ozone is good up high, bad nearby!”
  - Page 17:
    - “Look at what Coco and friends are doing—walking, biking, sharing rides! That helps make the air cleaner!”
  - Page 19:
    - “Do you see these colors? They tell us if the air is clean or dirty. Green means go outside and play! Orange means be careful!”
    - “Great job! We will talk about this tool more later!”

## **Discussion:**

- It's important that children don't breathe in dirty air because your bodies and lungs are still growing, and clean air will help you stay strong and healthy for the rest of your lives!
- Hold up photo of dust from cars as an example.
- There are small pieces of dirt in the air that we can't see but they can go into our lungs and make use cough or feel sick.
- Show infographic of particulate matter sizes.
- Now I want to show you something super cool that scientists made. After this, we'll play a game!
- So, this is called the Fire & Smoke Map (Hold up Fire & Smoke Map card).
- It's a special map that shows if the air is clean or dirty—especially when there are big fires.
- Show photo or physical Purple Air Sensor.
- Sensors are like little robots that use a laser to check the air for tiny dirty stuff.
- After the sensors check the air, they put the color of the dirty air on the map.
- Green means the air is clean!
- Yellow means there is very little dirty air!
- Orange means kids, older adults, and people that are sick, may need to go inside more.
- Red means the air is dirty and everyone should be careful going outside.
- Purple means the air is very unhealthy and everyone should stay inside all day.
- To check what the air quality is today, let's go onto [purpleair.com](http://purpleair.com) and see what the sensors are telling us!
- Ok, so now that we know more about dirty air let's play a game to dive deeper into how we can learn when the air is very dirty and bad for us to breathe or when it is clean and safe to breathe outside.

## **Coco Says Game (5-7 minutes):**

- Now, it's time to play our game! Has anyone ever played Simon Says? To remind you the rules, when we say a color you're going to do the action that represents the color based on our rule sheet. If I say 'Coco says it's green' and you do the action, then you're still in the game. If I only say 'it's green' and I don't say 'Coco says' first and you do the action, then you sit down until the round is over.
- Play a few rounds. In each round say ~ 7 different colors.

- Good Job everybody! Everyone quietly move back to your seats on the carpet so that we can finish up the lesson!
- Awesome friends! You guys really seem to understand how air sensors work now! Thank you all for playing the game so nicely.

### **Coloring Page (10 minutes):**

- Okay friends, sit back down on the carpet so we can explain your next activity. We are going to be coloring!
- (Show AQI Coloring page to the class) First, we want you to color your own air quality index! Remember those colors we learned about during Coco Says? Now it's your turn to remember the colors and what they mean. For example, what color would this happy smiley face be? Yes, green!
- (Show chameleon page to class) Next, you get to design your very own chameleon like Coco! Remember, chameleons can change colors, so you can color it however you want!
- Sit back at your desks, and we will pass out the coloring pages to you. (Ambassadors should walk around and see if any students need help with the AQI page, or ask how they're going to design their chameleon).
- Okay friends, time to come back to the carpet. Remember, you get to keep your coloring pages, so if you aren't done yet, you can always finish them at home. Now we are going to tell you about a gift we are leaving for your class!

### **Classroom Daily AQI Tracker:**

- We brought a gift for you to keep in the classroom so that you can track the air quality index color everyday.
- Can you help your teacher remember to check the purple air sensor map website everyday and place Coco on the correct color of the outside air quality?
- Awesome! Now, it's super important to check it everyday before recess so that you know if you should take breaks when you're playing.
- Today the air quality is \*color\*, so we can put Coco on the \*color\*

### **Wrap-Up:**

- You guys have learned so much today about air quality! To wrap up our visit, we have a few final questions for you. Show a thumbs up if you think the answer is yes or a thumbs down if you think the answer is no.
- Q: Can you see dirty air?
- A: No, that's right! Remember we said the dirty pieces are too small to see them but sometimes we can see big smoke, like from cars or fires.
- Q: Is there more dirty air when it's hot outside?

- Yes, dirty pieces mix with sun to create super dirty air.
- Ok, last question!
- Q: If the sensor said the air was red air quality, would you want to go outside to play?
- A: No? Good! The air is too dirty to play outside.
- Great job everyone!
- Before we go, we would love to give each of you a magnet to remember all the different colors of air to take home with you! We want you to have these magnets to remember all that cool stuff we learned together and share what we learned with your friends and family.
- (Pass out a magnet to each student or leave enough magnets with the teacher)
- Now that you are all officially Junior Clean Air Ambassadors just like us, can we do our Clean Air chant one more time? Great!
- Can everyone stand up on their feet and take one step back? Great! Watch and I do it first, then we will do it all together!

*When I say "Clean", you say "Air"; "Clean", "Air"; "Clean", "Air";*

*slap slap - clap clap - snap snap;*

*"Clean Air!!"*

- Awesome! Thank you all for learning with us the last three lessons, we had so much fun with you all!