

Arjun Raaj Ray

Education

Elementary: Wild Horse Elementary School

Middle: Crestview Middle School: GPA: 3.9

Awards

- 2017 Broadcom Masters nomination for his innovative project on Food waste
- 2017 Monsanto Science Award for his science project in St Louis Science Fair
- 2017 **Presidential Volunteering** Service Award for his commitment in civic service from the Office of the President of the United States.
- 2017 Prudential Volunteering Service Award for his engagement in community service
- **2016 Naval Science Award** from the Office of US Naval Research, Arlington, VA for winning the competitive research project
- Nominated to compete in **Broadcom Masters**, in recognition of outstanding performance at a society-affiliated Science Fair in 2016
- **2016 Mastodon State Historic Site Winner**. His project was selected to display in the Mastodon State Historic Museum, Imperial MO
- Secured First place (Gold medal) in Biochemistry for his science project presentation at Mastodon fair 2016
- Duke University TIP gifted program since 2013 till present.
- Awarded scientific excellence award by US metric Association for top scientific project in 2015.
- Bronze Medal in competitive science project presentation at Mastodon Fair, 2015.
- Amphora award from Crestview Middle school for high academic performance in 2015, 2016.
- Awarded outstanding Achievement award by Monsanto for top scientific project In Academy of Science, St Louis Science Fair in 2015.
- Awarded the best scientific project by American Concrete Institute in 2014 St Louis Science fair.
- Honored by Mayor of Chesterfield city in recognition of his Recycling project, 2014.

Achievements

- Member of Parkway- Rockwood interschool Honors Orchestra group- 2015, 2016.
- Received the best rating in the Wild Horse school choral group performance at the Six Flags Music Festival in May 2014.
- Selected to participate in beta testing of “Alice”, a **computer program** developed by Department of Computer Engineering, Washington University, St Louis, July 2014.
- Received Certificate of appreciation of his **scientific experimental poster presentation** on “Effect of climate change on life” by Chesterfield City, April 2013.
- Selected to participate in **beta testing of “Looking Glass” computer program** developed by Department of Computer Engineering, Washington University, St. Louis, November 2014.



Your Blue Planet's GREEN Challenge

Secondary Edition - July 2013

So it was a hot summer in 2012. But just how hot was it?

- St. Louis set its all-time high June monthly temperature record on June 28th with a temperature of 108°F smashing the old record of 105°F from in June of 1936 and 1952.
- This was the hottest temperature recorded since July 18, 1954 when the temperature rose to 112°F in St. Louis. The average temperature in St. Louis in July was- 88.1°F - it was the warmest month since weather data collection in St. Louis began in 1874.
- Missouri declared an emergency because of the heat and drought.
- According to the National Weather Service, 2012 was the warmest year on record in St. Louis, with an average temperature of 61.2°F, a full 1.1°F higher than the previous high average temperature of 60.1°F set in 1921.
- Water level in the Mississippi remained 'record low' caused by the drought. Water had to be released from the upper Mississippi River in an effort to avoid closure of the river at St. Louis to barge traffic.

The "warmest first half of any year on record for the United States" led to "more than half the country experiencing drought, the largest percentage in the 12-year history"

Climate change - warmer winters - hotter summers - water restrictions - greenhouse gases - carbon footprint - green energy - green business - reduce, reuse, recycle - conservation, preservation, efficiency - sustainable growth - new ways of living - Sound familiar?

We have come a long way in understanding our Planet Earth, in preserving our natural resources, and in nurturing



our own Blue Planet!

Ordinary people are doing extraordinary things by finding innovative solutions to everyday problems.

Young people all over the world are making a difference, showing us how to respect and replenish the Earth, leading efforts to help save our precious environment, the thin shield between life on Earth and the lifeless Universe.

Locally, St Louis County was awarded funds by the U.S. Department of Energy in July, 2009, to develop an Energy Efficiency & Conservation Strategy (EECS) to increase energy efficiency, decrease auto dependence, increase recycling, and invest in renewable energy resources. Green is good!

Busch Stadium and the City of Chesterfield installed solar thermal systems that reduce energy use. The energy produced is done at zero additional cost. Solar is sustainable!

Eco-friendly school buildings of the 21st Century are being built, such as Crossroads College Preparatory School in St. Louis. The building is LEED-certified, meaning that it has met high standards for efficient use of water and electricity, sustainable construction methods and high indoor environmental quality.

John Burroughs School in St. Louis is using kitchen grease to create biodiesel fuel to power tractors used on campus.

The New City School in St. Louis installed a green roof over its dining hall; Chesterfield's Amphitheater concession building has a "green" roof with special vegetation! Green roofs serve several purposes for a building, such as absorbing rainwater, providing insulation, creating a habitat for wildlife, and helping to lower urban air temperatures to mitigate the 'heat island effect'.

Citizens Committee for the Environment - City of Chesterfield

The general guidelines and tips presented help promote conservation of native, natural and/or energy resources.



Your Blue Planet's GREEN Challenge

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Conserving Energy at Home

... don't forget to include your family members!

Carbon dioxide and other greenhouse gases warm the surface of the planet naturally by trapping solar heat in the atmosphere. This is a good thing because it keeps our planet habitable. However, burning fossil fuels such as coal, gas and oil and clearing of forests have increased the amount of carbon dioxide in the Earth's atmosphere and global temperatures are rising. The combustion of fossil fuels to generate electricity is the largest single source of CO2 emissions in the US, generating about 40% of total U.S. CO2 emissions.

Learn more : <http://www.epa.gov/climatechange/ghgemissions/gases/co2.html>

Good Neighbors

1. **Turn off all appliances (lights, fans, TV, etc.) and electronic devices you're not using.** Yes No
Simply turning off your television, DVD player, stereo, and computer when you're not using them will save thousands of pounds of carbon dioxide a year.
2. **Unplug electronics from the wall when you're not using them.** Yes No
Even when turned off, hairdryers, cell phone chargers and televisions use energy. The energy used to keep display clocks lit and memory chips working accounts for 5 percent of total domestic energy consumption and puts 18 million tons of carbon into the atmosphere every year!
3. **Replace a regular incandescent light bulb with a compact fluorescent light bulb (CFL).** Yes No
CFLs use 60% less energy than a regular bulb. This simple switch will save about 300 pounds of carbon dioxide a year. If every family in the U.S. made the switch, carbon dioxide would be reduced by more than 90 billion pounds! Burned out CFL light bulbs can be recycled, too!
4. **Move your thermostat down 2 degrees in winter and up 2 degrees in summer.** Yes No
Almost half of the energy we use in our homes goes to heating and cooling. About 2,000 pounds of carbon dioxide a year could be reduced with this simple adjustment.
5. **Talk to your parents about regularly cleaning or replacing filters on your furnace and air conditioner.** Yes No
Cleaning a dirty air filter can save 350 pounds of carbon dioxide a year.
6. **Talk to your parents about installing a programmable thermostat.** Yes No
Programmable thermostats will automatically lower the heat or air conditioning at night and raise them again in the morning. They can help save approximately \$100 a year on the energy bill.
7. **Talk to your parents about wrapping your water heater in an insulation blanket.** Yes No
This will help to save 1,000 pounds of carbon dioxide a year with this simple action. Additional 550 pounds of carbon dioxide per year can be saved by setting the thermostat no higher than 120 degrees Fahrenheit.
8. **Use less hot water.** Yes No List where you use less hot water Sink, Shower, Dishwasher,
Washing machine, bathtub

It takes a lot of energy to heat water. You can use less hot water by installing a low flow showerhead (~ 350 pounds of carbon dioxide saved per year) and washing your clothes in cold or warm water (~500 pounds saved per year).



Your Blue Planet's GREEN Challenge

Secondary Edition - July 2013

Don't forget the Kitchen

... and work with your parents to achieve the following:

Good Neighbors

1. Run your dishwasher when full and use the energy-saving setting so as not to use the "drying cycle" and just let dishes drip dry. Yes No
2. Keep condenser coils clean on the back of your refrigerator. Help your parents to gently wipe and vacuum them once a year. Yes No
3. Keep the back of your fridge at least four inches from the wall. Yes No
4. Make sure your fridge door gasket seals tight. Test it by putting a flashlight in the fridge and see whether light leaks out after closing the door. Yes No
5. Check the temperature of your fridge and freezer by putting a thermometer in a glass of water. Put the glass of water on the center shelf in the center of the fridge. It should read 38-40 degrees Fahrenheit. The freezer should read 0-5 degrees Fahrenheit. Yes No
What is the freezer temperature reading? -5°F
6. Make sure your fridge is level to ensure the door gets closed every time you open it. Yes No
7. Let hot food cool down a bit before you put it in the fridge. Yes No
8. Use a microwave rather than an oven, range or toaster oven whenever possible. Yes No
9. Use smaller appliances instead of big ones, such as a toaster oven, electric teapot, rice cooker, electric fry pan or a crockpot. Yes No
10. Cover pots and pans when cooking to keep heat in. Yes No
11. Bake with glass or ceramic pans that allow you to set the temperature in the oven by 25 degrees Fahrenheit lower than what the recipe calls for. Yes No
12. Thaw food on metal such as in a stainless steel pan instead of microwave. Put in fridge for overnight thawing. Yes No

Innovators:

Do you know what a pressure cooker is? How it works? Can it save energy? Yes No

Explain: A pressure cooker is a sealed pot with a valve that controls the steam pressure. As it heats up the liquid turns to steam which

Leaders:

Raises the pressure, raising the boiling point of water and forces liquids into
Can you share one new idea about energy savings in the kitchen? Yes No boiling or oven cooking.
Explain: _____

Special note:

You can turn off the stove burner or oven a little before the food is completely cooked. Cooking will continue and food will be ready by the time you get everybody at the table.

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Your Blue Planet's GREEN Challenge

Secondary Edition - July 2013

Alternative Energy

Good Neighbors

1. Have you heard about Alternative Energy? Yes No
2. Alternative energy production generally does not create pollutants. Correct? Yes No
3. Does Alternative Energy generally mean use of a renewable source? Yes No
4. Does fossil fuel energy (generated by Petroleum and Natural Gas) use non-renewable sources? Yes No
5. Can you give two examples of Alternative Energy? Yes No Solar and Wind
6. Do you know of two sources of alternative energy present all around us? Yes No

What are they? Solar and Wind

7. Do you know what Bio-diesel is? Yes No What is it? It is a substitute for diesel
8. What's Bio-diesel produced from? Yes No Ethanol from corn, Animal fat
9. Do you know what is Bio-diesel used for? Yes No A cleaner way to power cars, and machines.
10. Can Solar Energy be used for Heat and Electricity? Yes No
11. Do "Solar cells" change sunlight directly into electricity? Yes No
12. Can you name what alternative energy "Windmills" use? Yes No What is it? Wind

Innovators:

Do you know what form of energy, fossil energy or alternative energy (solar, geothermal, wind, water power) people have used the longest? Yes No

Explain: Fossil energy, in 2000 BC the Chinese used coal as an energy source.

Leaders:

Put together a short presentation on sources of sustainable and renewable energy to present to your family, friends and classmates, if possible. Yes No

Explain: _____

Special note:

In 2011, wind turbines in the United States generated about 3% of total U.S. electricity generation. It was equal to the annual electricity use of about 10 million households. The amount of electricity generated from wind has grown significantly in recent years. Generation of energy from wind in the United States increased from about 6 billion kilowatt-hours in 2000 to about 120 billion kilowatt-hours in 2011.



Your Blue Planet's GREEN Challenge

Secondary Edition - July 2013

Environment

Good Neighbors

1. Do you know about our region's native plants and animals? Yes No

List some: Bobcat Lynx, Coyote canis, Missouri Primrose, Missouri Gooseberry

2. Do native plants and animals co-exist sustaining native ecology? Yes No

3. Do certain species of plants depend on certain species of animals to sustain lifecycles with, for example, pollination and food sources? Yes No

4. Do you know what a sustainable habitat garden is? Yes No

List 3 characteristics: Provides food and shelter for organisms, soil and water conservation, and supporting native plants.

5. A sustainable habitat garden sustains pollinators, for example, by providing food, water, cover and a place for wildlife to raise their young, all with native plants. Correct? Yes No

6. Do you know what pollinators are and why they are important? Yes No
Why? _____

7. Have you heard about Rainwater harvesting? Yes No

8. Do you know what Rainwater can be used for? Yes No

List 2 things: Watering the lawn and laundry

9. Have you seen an air filter used at your home? Yes No

10. Do you know about 'Living' air filters in your home? Yes No

Name one. _____

11. Do you know Chesterfield is a Certified Community Wildlife Habitat by the National Wildlife Federation, the only one in Missouri and 9th in USA? Yes No

You can read about on this website!

<http://www.chesterfield.mo.us/citizens-committee-for-the-environment.html>

12. Do you know what the NWF is? Yes No

What? _____

Innovators:

Can you plant a native tree on your balcony/porch (in a pot), in your backyard, at school, or any other place? You can get one free at Chesterfield's Annual Earth Day Festival. Yes No

Explain: ~~gather~~ I would gather everyone in my grade and

Leaders:

Can you e-certify your garden with the National Wildlife Federation (NWF), which will add sustainable metrics to our community certification? More information is available on the City of Chesterfield's website. Yes No

Explain: _____
Visit: <https://www.nwf.org/How-to-Help/Garden-for-Wildlife/Community-Habitats.aspx>

Special note:

A Community Wildlife Habitat is a community that provides habitat for wildlife throughout the community--in individual backyards, school grounds, public areas such as parks, community gardens, places of worship and businesses. It is a place where the residents make it a priority to provide habitat for wildlife by providing the four basic elements that all wildlife need: food, water, cover and places to raise young.

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