Warner Internship for Scientific Enrichment (WISE) - Activity Summary

Elena Tomasi, 07/07/2017
My WISE proposal

- Perform hands-on science experiences for K-12 students
- Focus on a specific under-represented group in atmospheric sciences: girls
- Get involved in projects developed for girls inclusion and to raise their awareness in science, technology, engineering, and mathematics (STEM) disciplines
- Introduce girls to atmospheric physics and make them appreciate the impact of atmospheric science on society
Framework of my WISE activities

- International science and education program
- NSF funded PBS Kids show that encourages girls in STEM
**GLOBE/Scigirls workshops**

- **WHAT:** 4 Saturday workshops from April 22 till May 13
- **WHERE:** Boulder Ridge Mobile Home Park (Lafayette)
- **WHO:** 6 to 14 years-old girls
- **WORKSHOP TOPICS**
  - OUR PLANET: Cloud Clues and Wetland Band
  - HEALTHY BODY: Working it out and Hearth to hearth
  - ENGINEERING AND DESIGN DAY: Blowin’ in the Wind
  - ENGINEERING AND DESIGN DAY: Robots and aerodynamics
My research at RAL

- Working in the Weather Systems Assessment Program (WSAP) with Branko Kosovic and Pedro Jimenez
- High-resolution weather simulations over complex terrain
- Testing and evaluating a new WRF 3D PBL scheme developed in order to improve model forecast over complex terrain
- Many different applications:
  - ENERGY PRODUCTION FROM WIND POWER PLANTS
  - ACCURATE FORECAST OF POLLUTANT DISPERSION
Workshop on wind energy

1. Introducing the topic: Scigirls episode «Blowin’ in the wind»
2. Discussing the topic
3. Hands-on activities using a science game
4. Hands-on activities: build your own windmill
Workshop on wind energy

2. Discussing the topic:
   - What is energy?
   - Which sources and forms of energy exist?
   - Which energy is renewable? Which one is not?
   - Can we transform energy?
Workshop on wind energy

3. Hands-on activities using a science game
   ▶ Which are the components of a wind turbine?
   ▶ Does the design of the blades matter?
   ▶ Can we transform the wind energy in something else?
     • Lift a weight!
     • Light an LED!
   ▶ Does the strength of the wind matter?
Workshop on wind energy

4. Hands-on activities: build your own windmill!
   - Can we build a windmill that lights up an LED?
   - What do we need?
   - How can we proceed?
   - Is it working?
   - What else can we do to light the LED up?
What I learned from this experience

- When you teach kids STEM:
  - Change your vocabulary (drastically)
  - Increase their curiosity on the topic, let them understand how science is important to our society
  - Let them work in groups and learn from each other
  - Don’t give them answers, give them questions!
  - Don’t force them to get to your solution, let them experiment their own different (wrong?) ways
Further developments

- Continue to participate to the GLOBE program from Italy
  - Italy is an active member in the GLOBE program
- Propose the same workshop in my hometown, Trento
  - Does a different scholastic system influence kids attitude towards STEM disciplines?
- Introduce the workshop in the teaching program of the MUSE, the Science museum in Trento
THANK YOU

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