



Taylor Wilson: Yup, I Built a Nuclear Fusion Reactor

"In the history of America, we've never had an energy plan. We don't even realize the resources we have available to us."

- T. Boone Pickens

"I started out with a dream to make a star in a jar, and I ended up ... making things that I think can change the world."

- Taylor Wilson

Physics wunderkind Taylor Wilson astounded the science world when, at age 14, he became the youngest person in history to produce fusion. The University of Nevada-Reno offered a home for his early experiments when Wilson's worried parents realized he had every intention of building his reactor in the garage.

Wilson now intends to fight nuclear terror in the nation's ports, with a homemade radiation detector priced an order of magnitude lower than most current devices. In 2012, Wilson's dreams received a boost when he became a recipient of the \$100,000 Thiel Prize. Wilson now intends to revolutionize the way we produce energy, fight cancer, and combat terrorism using nuclear technology.

Themes/Context:

- The future of energy
- Education and child prodigies
- The safety of nuclear power

Grammar Aim:

- Basic future tense usage/practice
- Vocabulary

Introduction and Discussion

Start with brief discussion on energy needs and production in the students' country.

- What is the production of energy like in your country at the moment? Is it expensive or dangerous in any way, and does it need to change?
- How do you feel about people as young as 16 or 17 making some large contributions to science and/or business?
- How safe do you consider nuclear power to be? Would you like to see more nuclear power plants in your country, or less?

Video

Watch the talk with students and ask them if after watching it they feel compelled to change their answers to any of the above questions. Short discussion to follow if possible.

Comprehension Checking**T/F Questions**

1. Taylor Wilson built a nuclear fusion reactor when he was fourteen years old.
2. Wilson believes that nuclear fusion is not the future of energy, because it does not 'break even.'
3. The University of Nevada is where Taylor built his fusion reactor.
4. The detector he developed replaced the one used by Homeland Security, and is much cheaper.
5. Wilson believes that kids can make discoveries that will change the world.

Vocabulary

- | | |
|---------------------|---|
| 1. Physicist | A. To build something from already completed parts. |
| 2. Break even (PHR) | B. The materials left over after a chemical or physical reaction. |
| 3. Assemble | C. A device used (in this context) to discover radioactive material. |
| 4. Byproducts | D. To at least generate as much energy (or money) as you spend, so that you don't lose anything. |
| 5. Detector | E. A scientist who studies physics |
| 6. Yellowcake | F. To create new technology through research and implementation. |
| 7. Develop | G. A Uranium byproduct of nuclear fusion. |

Gap Fill

Reactor	Byproducts (x2)	Hard
Break even	Produce	Similar
Sun	Assembled	Building
No such thing	Slams	Physics

So you may ask -- (Applause) You may ask me, well how do you know what our energy future is? Well I built a fusion _____ when I was 14 years old. That is the inside of my nuclear fusion reactor. I started _____ this project when I was about 12 or 13 years old. I decided I wanted to make a star.

Now most of you are probably saying, well there's _____ as nuclear fusion. I don't see any nuclear power plants with fusion energy. Well it doesn't _____. It doesn't _____ more energy out than I put in, but it still does some pretty cool stuff. And I _____ this in my garage, and it now lives in the _____ department of the University of Nevada, Reno. And it _____ together deuterium, which is just hydrogen with an extra neutron in it. So this is _____ to the reaction of the proton chain that's going on inside the _____. And I'm slamming it together so _____ that that hydrogen fuses together, and in the process it has some _____, and I utilize those _____.

Suggested Grammar

Simple Future:

FORM:

- Will + verb
- Am/is/are + going to + verb

USAGE:

- **Will:** To express a voluntary action or a promise
- **Going to:** To express a plan
- **Both:** To express a prediction

Future Continuous:

FORM:

- Will be + present participle
- Am/is/are + going to be + present participle

USAGE:

- Continuous action in the future
- Continuous action in the future that will be interrupted by a shorter action

Discussion

- In the future do you think the world will have converted to nuclear power, or something else?
- Do you think it is a good idea to allow teenagers to complete projects like Wilson's?
- What do you think the future of energy is in your country? How will the country have developed in 10 years, 50, 100, 500, 1000?
- Would you live near a nuclear power plant? Why/Why not?
- How effective do you think renewable energy is? How many different types can you think of?

Debate

Students to attempt to use the grammar structures and vocabulary as much as possible during the debate. They may use worksheets or board work for reference.

Possible Topics:

- Nuclear energy is the worst possible choice for our future. We should instead focus on renewable energy projects, which are powerful, cheap and sustainable.
- The claim that kids can change the world is untrue. They always need support from adults. Promoting the lie that they did it alone is detrimental to scientific progress. Additionally, anyone can achieve something like Taylor has, as long as they put in enough time and effort.
- Nuclear power is perfectly safe, and we have no reason to fear its implementation. In fact, it is the best possible choice for meeting the energy needs of the human race looking into the future.

Error Correction/Review

Note errors in target language/vocab during debate and encourage self-correction. Take to board where possible and review.