*Fundamentally Speaking Science­­*

***“What is the world made of?” “What holds the world together?”***

People have asked these questions for thousands of years. But only recently has a clear picture of the "building blocks" of our universe been developed. The scientists who have developed this picture work in an exciting and challenging field called high-energy or particle physics. Their discoveries are summarized in the chart: *Standard Model of Fundamental Particles and Interactions* that may be on display in your classroom or by your teacher.

How much do you know about the latest research on these ancient questions?

One way you can start to find out is:

* to read each of these statements AND
* indicate whether you agree (A) or disagree (D).

Statements

1. There are subatomic particles of matter that have no mass and no electric charge.

2. Some particles can travel millions of miles without ever being stopped (interacting with any other particles).

3. Antimatter is pure science fiction and is not science fact.

4. Some cancer treatments involve a particle accelerator.

5. The smallest components of the nucleus of an atom are protons and electrons.

6. Particles can all of a sudden materialize out of energy.

7. Particle physicists need larger accelerators in order to investigate larger and larger objects.

8. Magnets are used in circular accelerators to make particles move faster.

9. Work done by particle physicists at accelerators is helping us understand the very early development of the universe.

10. Gravity is the strongest of the fundamental forces of nature.

11. There are 92 naturally occurring subatomic particles.

12. All known matter is either made of leptons or quarks.

13. Friction is one of the fundamental forces of nature.

14. The smallest possible particle of matter is an atom.

15. The modern Periodic Table contains all the forms of matter in the universe.

16. Scientists use symbols to represent particles of matter in equations and formulas.

17. Every particle of one element (example: carbon) is 100% identical to every other particle of that same element.

18. Scientists use telescopes to observe physical events going on right now in other parts of the universe.

19. In general, we have cooler temperatures in winter because Earth is farther from our Sun during those months.

20. No country has ever exploded an atomic bomb in real life.

21. Even with our strongest telescope – we can only see objects within our own galaxy.

22. Black holes have only been hypothesized, no one has discovered a black hole.

23. The science discussed on the television show *The Big Bang Theory* is pure fiction.

24. Our moon is visible only at night.

25. Many of the physicists who will run the particle physics experiments using detectors that are currently being built are still

students in high school right now.