

Cosmic Chemistry: Cosmogony

**Quarks—Getting Down
to Fundamentals**

Quarks and Electrons

STUDENT ACTIVITY PART III

THOUGHT EXPERIMENT

After reading the Student Text, “Thought Experiments: Tracing Origins,” answer the questions in the spaces provided.

1. Where are quarks and electrons found in our universe today?
2. Where were quarks and electrons found in the 7th epoch?
3. Where were quarks and electrons found in the 6th epoch?
4. How did the number of “up” quarks and “down” quarks change during the 5th epoch? Where are electrons found in this epoch?
5. How are quarks and gluons different in the 4th epoch from all the preceding epochs?
6. Where are quarks, gluons and electrons found in the 3rd epoch?
7. What significant event is happening with relationship to quarks in the 2nd epoch?
8. If you traced your “origins” back to your parents, your grandparents, your great grandparents and on back into your “family tree,” do think you would ever find ancestors that are “unknown?”
9. How are your “unknown” ancestors similar and/or different from the “ancestors” of quarks and electrons?