How the Universe Works – Big Bang
Integrated Science 2 Name: Date:

1. Everything in the universe is made from matter created in the _____ _____ of the Big Bang.

2. There are three main questions about the Big Bang that are considered the holy grail of physics. What is one?

3. Our big bang is just one of many big bangs in an _____ _____ of universes.

4. At the beginning of the 20th century, the convention wisdom is that the universe is _____ and _____.

5. Edwin Hubble discovered that galaxies are moving _____ from Earth at incredible _____. This is the first real evidence of the big bang.

6. Galaxies that are twice as far away are moving _____ as fast. This became known as Hubble's Law.

7. The universe is _____billion years old.

8. Everything that matters to us today could have arisen out of _____.

9. The beginning of everything was a single point of _____ density and infinite _____ in a region smaller than a single atom…a point of raging energy.

10. The first force to emerge from the big bang was _____.

11. If gravity were weaker than it is, everything would fall apart and no galaxies could form. If gravity were stronger than it is, everything would end up in _____.

12. Immediately after the big bang, a shockwave of energy _____ the universe in a fraction of a second (this is the "inflation")

13. Temperatures during the big bang were so hot that the atoms of your body would _____.

14. What equation shows that we can get matter out of energy in the universe?

15. Early in the universe there were no atoms, but there were tiny, subatomic _____.

16. What is the one thing that can destroy a universe before it even gets started?

17. Antimatter has the _____ charge from regular matter.

18. For every billion particles of antimatter, there were _____ particles of matter. That was enough to build the universe.

19. As the temperatures of the universe cool, the particles begin bonding together to form atoms of elements. The first to form is _____, then _____ and lithium.

20. Before the universe became transparent, it was a milky soup of loose electrons. It took _____ years for the electrons to form atoms in the early universe.

21. One billion years after the big bang, the first _____ forms.

22. About _____ billion years ago, gravity begins to draw in dust and gas to give birth to our sun and solar system.

23. Space is at least _____ billion light years across.

24. Our universe is not slowing down, but is actually speeding up as it _____.

25. _____ energy is pushing the galaxies apart and is killing the universe.

26. What might happen if our universe DOES collapse back on itself?

27. 14 billion years ago, the big bang created _____ and space, our whole vast universe, and _____ in it.

Conclusion:

List at least two things you already knew about the big bang and two new things you learned from watching this video.

Finish with a final question that puzzles you the most about this concept.