## History of the Universe

Use the diagram explained in the History of the Universe Power Point to fill in the blanks to explain what event occurred at each time and the contents of the universe during each era<sup>34</sup>

TIME	Era	EVENT OR CONTENTS
t = 0		
	Planck	
t $\approx 10^{-43}sec.$		
	GUT	
† ≈ 10 <sup>-38</sup> sec.		
	Inflation	
	Electroweak	
t $\approx 10^{\text{-10}}\text{sec.}$		
	Particle	
$t \approx 10^{-3}$ sec.		
	Nucleosynthesis	
t $\approx$ 3 min.		
	Nuclei	
t ≈ 500,000 yr.		
	Atoms	
t ≈ 1,000,000 yr.		
	Galaxies	

present		「日本の				Humans
					stars,	observe the cosmos
Era of Galaxies		• •		•	garaxies and clusters (made of	
1 billion					plasma)	
years					atoms and	First galaxies form.
Era of Atoms					plasma (stars begin to form)	Atoms form; photons fly free
1.10			• • •		plasma of hvdrogen and	and become microwave background.
Nuclei 9	88		9 8 9		helium nuclei plus electrons	Fusion ceases; normal matter is
3 minutes Era of Nucleosynthesis	00.00	00.88	0000 0000 0000 0000 0000		protons, neutrons, electrons, neutrinos (antimatter rare)	
0.001 seconds	0.000	0000	0.00	e ele	elementary particles	Matter annihilates antimatter.
Particle Era 10 <sup>-10</sup> seconds Electroweak Era				(antimatt common)	(antimatter common) lementary	Electromagnetic and weak forces become distinct.
10 <sup>-38</sup> seconds			くろいていています	particles	8	Strong force becomes distinct. perhaps
	GUT Era	Era	elementary	×		causing inflation of universe.
10 <sup>-43</sup> seconds	Planck Era	k Era	2222			
neutron electron proton meutrino		antiproton - antineutron	on	antieleo	antielectrons 🚑 q	quarks