

NAME:  
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## Test on “Fundamental particles & interactions”

### I) The history of the fundamental particles

*To understand the birth of the Universe which we call “the Big Bang”, scientists have investigated the structure of matter at huge energies.*

1. What was the first particle to be discovered? Give 2 fields of its applications.

1,5

*Lots of particles have been discovered, even some which do not seem to be useful for building the usual matter.*

2. How did scientists classify them? Give 2 properties which can be used to classify particles.

1,5

### II) Interactions between particles

1. What are the 4 fundamental interactions?
2. Which particles are involved in each interaction?
3. What are the effects of each interaction?
4. What is the messenger particle of the electromagnetic interaction?
5. What is the messenger particle of the strong force?
6. What is the name of the “elusive” particle involved in the weak interaction? Why is it “elusive”?

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### III) Fundamental questions

Choose 1 block of questions and answer them:

*(If you choose more than 1 block, only the first one will be corrected)*

1. What is the “Big Bang” and when did it happen? How was the Universe then and how did it evolve? The Universe is composed of only 4% of visible matter: what is the rest composed of?
2. How many building blocks are there in the standard model? What are the 2 types of particle? How are they arranged? Are they all stable? If not, which ones are stable?
3. What are the common point and the difference between matter and anti-matter? What happens when matter and antimatter meet? When and where was the positron discovered? Are scientists able to create antimatter, without creating matter at the same time?
4. What are the 2 invisible substances of the Universe called? What is the percentage of each one? How can we detect them? What are their effects on galaxies and on the whole Universe?

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