FREE REVISION PACK

Classification of Particles

AQA A-level Physics · 7407 / 7408 · Specification 3.2.1.5

Easy | Medium | Multiple choice · past-paper questions

5	5	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	Baryons and leptons in a carbon atom	AQA June 2019 · AS Paper 2 · Q9	1 mark
2	Easy	Properties of the muon	AQA June 2019 · AS Paper 2 · Q10	1 mark
3	Easy	How strange particles are made and decay	AQA June 2017 · AS Paper 2 · Q13	1 mark
4	Easy	Which interactions do hadrons and leptons feel?	AQA June 2017 · AS Paper 2 · Q6	1 mark
5	Medium	The particle family tree	AQA 2021 · AS Paper 2 · Q35	1 mark

Key ideas to have ready

- **Hadrons** feel the strong interaction and are made of quarks: **baryons** (three quarks, e.g. p, n) and **mesons** (quark + antiquark, e.g. π, K).
- **Leptons** (electron, muon, neutrinos) do not feel the strong interaction; they feel the weak interaction (and electromagnetic if charged).
- The muon is a heavier version of the electron: it is unstable and decays into an electron and neutrinos by the weak interaction.
- Strange particles (e.g. kaons) are produced by the strong interaction, always in pairs, and decay by the weak interaction.

How to use this pack

1. The questions are grouped into levels (Easy and Medium). Work through them in order, and check your answers at the end of each level before moving on.
2. Every question is multiple choice with one correct answer. Write down your working anyway; that is how you find mistakes.
3. The separate mark scheme uses the same numbers and explains every answer.

Levels are based on how students did in AQA's examiner reports where that information exists, plus our own difficulty rating. *About 1.5 minutes per question.

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Easy

Definitions and one-step ideas. Most students get these right.

Questions 1–4

Only **one** answer per question is allowed. For each question, completely fill in the circle alongside the appropriate answer.

AQA June 2019 · AS Paper 2 · Q9

1 Which row gives the numbers of baryons and leptons in an atom of $^{12}_{6}C$?

[1 mark]

	Number of baryons	Number of leptons	
A	6	6	⬭
B	12	6	⬭
C	6	12	⬭
D	18	0	⬭

AQA June 2019 · AS Paper 2 · Q10

2 A muon

[1 mark]

A is subject to the strong interaction. ⬭

B can decay into an electron only. ⬭

C is a stable particle. ⬭

D is subject to the weak interaction. ⬭

AQA June 2017 · AS Paper 2 · Q13

3 What interactions are involved in the production of a strange particle and its decay into non-strange particles?

[1 mark]

	Production	Decay	
A	strong	weak	⬭
B	strong	strong	⬭
C	weak	strong	⬭
D	weak	weak	⬭

AQA June 2017 · AS Paper 2 · Q6

4 Which row shows the correct interactions experienced by a hadron or a lepton?

[1 mark]

	Particle	Strong interaction	Weak interaction	
A	Hadron	Yes	Yes	⬭
B	Lepton	Yes	Yes	⬭
C	Hadron	Yes	No	⬭
D	Lepton	Yes	No	⬭

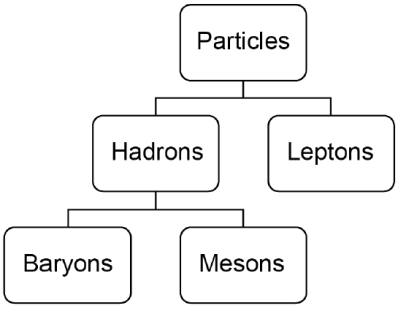
Medium Two or three steps. Roughly a third to a half of students get these right. **Question 5**

AQA 2021 · AS Paper 2 · Q35

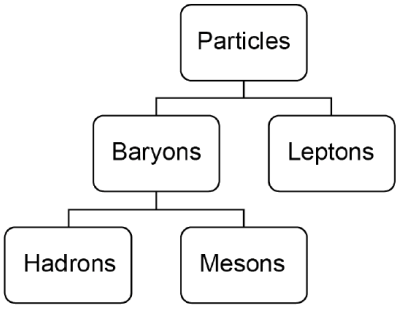
5 Which shows the classification of particles?

[1 mark]

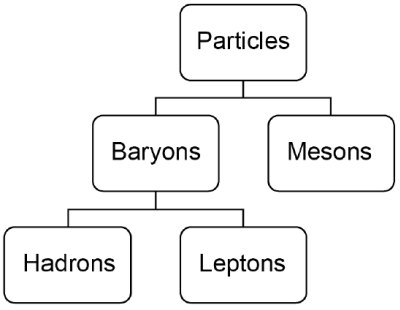
A



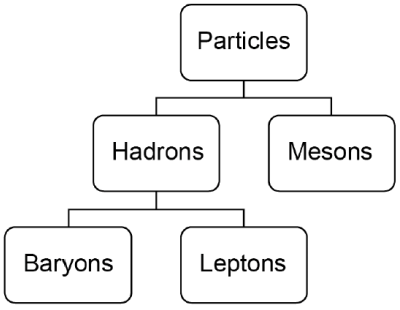
B



C



D



End of questions. Check your answers with the matching mark scheme. More free packs and 1-to-1 tuition:
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