

(The nuclear model and the development of the atom)

Q1.a) (2018)

B

Q1.b) (2018)

C

Q1.c) (2018)

A

Q2. (2018)

Chadwick provided the evidence
to show the existence of
neutrons

(this was necessary because)
isotopes have the same number
of protons

or

(this was necessary because)
isotopes are atoms of the same
element

but with different numbers of
neutrons

Q3. (2019)

most (alpha) particles passed
(straight) through (the gold foil)

(so) the mass of the atom is
concentrated in the nucleus /
centre

or

(so) most of the atom is empty
space

some (alpha) particles were
deflected / reflected

(so) the atom has a (positively)
charged nucleus / centre

Q4. a). (2020)

- mostly empty space
- the positive charge is (all) in the nucleus
- the mass is concentrated in the nucleus
- the electrons and the nucleus are separate

Q4. b). (2020)

atomic number is the number of protons

(and) protons were not discovered until later

Q4. c). (2020)

so their properties matched the rest of the group

Q5. (2020)

electrons orbit the nucleus

electrons are at specific distances from the nucleus

Q6. (2023)

a ball of positive charge

with (negative) electrons
embedded

Q7. (2023)

(earliest) electrons
 protons
(latest) neutrons

Q8. a). (2024)

(model **A**) plum pudding

(model **B**) Bohr

Q8. b). (2024)

Differences

- model **A** has no nucleus
or
the model used today has a nucleus
- model **A** has no protons
or
the model used today has protons
- model **A** has no neutrons
or
the model used today has neutrons
- model **A** has positive charge spread throughout the atom
or
model **A** is a ball of positive charge
- the model used today has the positive charge in the centre
- model **A** the electrons are distributed randomly
- the model used today has electrons in shells / energy levels
- the mass was spread throughout model **A**
- the mass is concentrated at the centre of the model used today
- model **A** does not have empty space
- model used today is mostly empty space