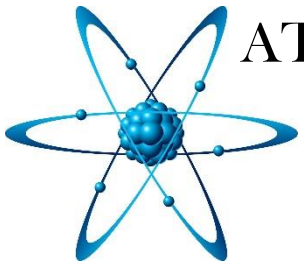
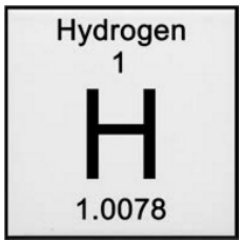
NAME _____ MAIL BOX_____



ATOMS and THE PERIODIC TABLE



ATOM

ATOMIC NUMBER

ATOMIC MASS

ISOTOPES

AMU

Sketch a model of an atom to the best of your ability in the box on the right. Save space on the left

---

Atomic theorems: NOTES

1.

2.

3.

4.

5.

READING – Utilize classroom text, your text at home or Mr Burn's web page

To answer the following:

14-1 What are atoms?

Page 258 - 259

What is the list here? →

_____

- All elements are composed of atoms. Atoms cannot be divided or destroyed.
- Atoms of the same element are exactly alike.
- Atoms of different elements are different.
- The atoms of two or more elements can join together to form compounds.

Check

1. An atom is the smallest part of an _____.

2. Dalton stated that atoms can join together to form _____.

3. The first person to use the word "atom" was _____.

4. The _____ believed that atoms were hard particles that were always moving.

5. Dalton based his atomic theory on experiments and _____.

Apply

6. Compare: How were the ideas of Democritus and Dalton similar?

_____

7. Do you agree with Democritus that atoms are "small hard particles"? Why or why not?

8. Hypothesize: What kind of information might be available to scientist today that would lead them to disagree with Dalton's atomic theory?

READING – Utilize classroom text, your text at home or Mr Burn's web page

To answer the following:

14-2 What are the parts of an atom?

Page 260 - 261

List: What are the 3 types of particles _____

Check

1. What are electrons? _____

2. Where are protons found in the atom? _____

3. What are the neutral particles in atom called? _____

4. Who was the first to suggest that atoms were made up of smaller particles? _____

5. Who discovered that the atom is mostly empty space _____

6. Who said that elements are found in energy levels around the nucleus? _____

Apply

7. Compare: How did Rutherford's model of the atom differ from Thomson's model?

_____

8. Suppose that you could look at the electrons in a hydrogen atom, an oxygen atom, and a carbon atom. Would the electrons all look like?

9. _____

Skill Builder

Analyzing In his experiment to test Thomson's model of the atom, Ernest Rutherford shot positively charged particles at a sheet of gold foil. The foil was only a few atoms thick. Rutherford observed that most of the particles went right through the foil. A few particles were deflected, or bent away, from the foil. A few particles bounced straight back from the foil. How did these results help Rutherford reach the following conclusions? (Hint: Remember that like charges repel each other.)

a. Most of an atom is empty space.
b. An atom has a dense nucleus in the center.
c. The nucleus is positively charged.

READING – Utilize classroom text, your text at home or Mr Burn's web page

To answer the following:

14-3 What is atomic number?

Page 262 - 263

Define: What is atomic number? _____

Check

1. The atomic number is the number of _____ in the nucleus of an atom.

2. Every _____ has its own atomic number.

3. Elements are arranged in order of increasing atomic number in the _____.

4. If an atom of an element contains 12 protons and 12 electrons, the atomic number of that element is _____.

5. An atom is _____ when the negative charges and the positive charges cancel out.

6. The number of protons in an atom is equal to number of _____.

Apply: *see table pg 262*

7. Atoms of this element contain 17 protons. _____

8. This element has an atomic number of 20. _____

9. The atoms of this element have 8 protons and 8 electrons. _____

10. An atom of this element has 10 more protons than an atom of sulfur. _____

People in Science:

What did Chien – Shiung Wu discover? Why was she significant?

_____

_____

READING – Utilize classroom text, your text at home or Mr. Burn's web page

To answer the following:

14-4 What is atomic mass?

Page 264 - 265

Define: What is the mass, in AMU, of an atom with 1 proton and 2 neutrons? _____

Check – *true or false (if false change underline word to make it true).*

____1. The mass of a neutron is the same as the mass of a proton. _____

____2. Because they are so small, neutrons are not counted when measuring the mass of an atom. _____

____3. The gram is the unit used by physicists to measure the mass of an atom. _____

____4. The mass number tells the number of protons and neutrons in the nucleus of an atom. _____

____5. If the atomic number of an element is 8 and the mass number is 16, the number of neutrons in an atom that element is 24.

Apply: *complete the following*

6. **Calculate:** The atomic number of element X is 30 and the mass number is 65. Find the number of protons, neutrons and electrons in an atom of element X.

7. **Hypothesis:** A few of the heavier elements have the same mass number. How is this possible, if no two elements have the same atomic number?

People in Science:

What did Dmitri Mendeleev discover? Why was this significant?

_____

_____

READING – Utilize classroom text, your text at home or Mr Burn's web page

To answer the following:

14-5 What are isotopes?

Page 266 - 267

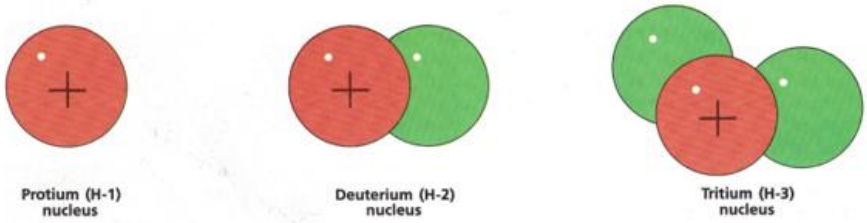
Define: What causes atoms of the same element to have different atomic mass numbers?

_____

Hydrogen can have an AMU of

1, 2 or 3 AMU

TRUE or FLASE



CHECK *Find the sentence in the lesson that answers each question. Then write the sentence.*

1. What causes some atoms of the same element to have different atomic masses?
2. What is an isotope?
3. How many isotopes do most elements have?
4. What are some familiar elements that have isotopes?

APPLY *Complete the following.*

5. How many neutrons are there in an atom of hydrogen-1? Of hydrogen-2? Of hydrogen-3?
6. Why is the atomic mass of an element not a whole number?
7. **Calculate:** The atomic number of carbon is 6. How many protons and neutrons are there in an atom of carbon-12? Of carbon-14?
8. **Analyze:** The mass number of oxygen is 16. Its atomic mass is 15.999. The atomic number of oxygen is 8. Which of the following statements about the isotopes of oxygen are true? Why?
   a. All of the isotopes have 8 neutrons.
   b. All of the isotopes have 8 or more neutrons.
   c. Some of the isotopes have fewer than 8 neutrons.
   d. All of the isotopes have fewer than 8 neutrons.

Write below here:

READING – Utilize classroom text, your text at home or Mr Burn's web page

To answer the following:

14-6 How are electrons arranged in an atom?

Page 268 - 269

Define: What is an electron cloud?

_____

LESSON SUMMARY

- The area in an atom where electrons are likely to be found is called the electron cloud.
- An energy level is the place in the electron cloud where an electron is most likely to be found.
- Each energy level in an atom can hold a certain number of electrons.
- An electron can change energy levels if it gains or loses a certain amount of energy.

Write below here:

CHECK *Complete the following.*

1. The term _____ refers to the area in an atom where electrons are likely to be found.
2. An energy level is the place where an _____ is most likely to be found in an atom.
3. The _____ energy level is located closest to the nucleus of an atom.
4. The second energy level can hold _____ electrons.
5. Some energy levels far from the nucleus can hold up to _____ electrons.
6. An electron will drop to a lower energy level when it _____ energy.

APPLY *Complete the following.*

7. **Analyze:** The atoms of a certain element have the first and second energy levels filled with electrons. What is the atomic number of this element? How can you tell?
8. **Infer:** What is the relationship between the amount of energy that an electron has and its distance from the nucleus of an atom?