

ChemQuest 9: Average Atomic Mass

Information: Weighted Averages

Examine the table of student test scores for five tests they have taken.

Test	Student A	Student B
1	95	76
2	74	88
3	82	90
4	92	81
5	81	72
Average Grade:	_____	_____

Critical Thinking Questions

1. Calculate the average grade for students A and B and enter the average in the table above.
2. If you know a student's average grade can you tell what the student's individual test scores were? Explain.
3. Suppose student C had an average of 83%. On each of his five tests he scored either 65% or 95%. Which score occurred more often? Explain.
4. What if the teacher decided that test five would count for 40% of the final grade and test four would count for 30% of the final grade and each of the other tests would count for 10%. Calculate the new average for each student. Note: this is called the weighted average.
Student A's new average: _____ Student B's new average: _____

Critical Thinking Questions

5. Neon has three different isotopes. 90.51% of neon atoms have a mass of 19.992 amu. 0.27% of neon atoms have a mass of 20.994 amu. 9.22% of neon atoms have a mass of 21.991 amu. What is the average atomic mass of neon?
6. Chlorine-35 is one isotope of chlorine. (35 is the mass number.) Chlorine-37 is another isotope of chlorine. How many protons and how many neutrons are in each isotope of chlorine?
7. Of all chlorine atoms, 75.771% are chlorine-35. Chlorine-35 atoms have a mass of 34.96885 amu. All other chlorine atoms are chlorine-37 and these have a mass of 36.96590. Calculate the average atomic mass of chlorine.
8. Do your answers for questions 5 and 7 agree with the average atomic masses for neon and chlorine on the periodic table?
9. A certain element has two isotopes. One isotope, which has an abundance of 72.15% has a mass of 84.9118 amu. The other has a mass of 86.9092 amu. Calculate the average atomic mass for this element.
10. Given the following data, calculate the average atomic mass of magnesium.

Isotope	Mass of Isotope	Abundance
Magnesium-24	23.985 amu	78.70%
Magnesium- 25	24.986 amu	10.13 %
Magnesium- 26	25.983 amu	11.17%