

The background of the slide is a collage of various playing cards, including the 4 of Hearts, 4 of Clubs, 4 of Spades, 3 of Hearts, 2 of Spades, 2 of Clubs, 2 of Diamonds, and Aces of all four suits. The cards are scattered and overlapping, creating a textured, patterned background.

Cross Classification

**Grouping by Several
Characteristics
at Once**

A Small Problem

- You have 51 cards in a deck. What is the fastest way to find out which card is missing?



The Value of Classification

- Classification – grouping based on similarities (just like we did with the playing cards)
- Consider a supermarket:
 - All the dairy foods are in one section.
 - All the produce is in another section
- Grouping helps the shoppers to find what they are looking for.



Refining Classification

- Lets take a closer look at the dairy section.



Soy milk

Skim milk

Whole milk

- There are additional classifications within the dairy section.
- Soy products can be in the produce section too! Soy fits in two classifications at once!!

Cross Classification

- Cross Classification - classifying into more than one group at a time
- Examples
 - Deck of cards
 - ✓ Suits and Numbers
 - Periodic Table
 - ✓ Groups or Families and Periods



- What do the elements in a vertical column of the Periodic Table have in common?

[illegible]

KEY

Atomic Mass →	12.011	-4	Selected Oxidation States
Symbol →	C	+2 +4	
Atomic Number →	6		

Electron Configuration → 2-4

Relative atomic masses are based on $^{12}\text{C} = 12.000$

Note: Mass numbers in parentheses are mass numbers of the most stable or common isotope.

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Summary

Classification on the Periodic Table

- Vertical columns
 - Called ***groups*** or ***families***.
 - Have elements with similar arrangements of valence electrons.
- Horizontal rows
 - Called ***periods***.
 - Have elements with the same number of shells.