

Categorizing Objects: Its Purpose and Role in Science and Education

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Observing, communicating, comparing (sequencing, grouping, and classifying), organizing, relating, and inferring are fundamental to scientific thinking processes. Teaching this way, rather than just teaching "the facts," is also important for developing the critical thinking skills of our future generations of a scientifically literate society.

This presentation will be a compilation of comments presented by scientists, science educators, and classroom teachers on the importance of categorizing in science and education.

As has been pointed out by Lawrence Lowery (1992): "The capacity for deriving patterns is more highly developed in humans than in any other creature that we know about." He goes on to say: "The fundamental underpinning of science is that it is an active pattern seeking enterprise... The active parts of science are its scientific thinking processes." Therefore, looking for patterns is the whole basis of our understanding of the world around us.

Two examples of the importance of classification are meteoritics and biology. By classifying meteorites and by comparing what we see in meteorites with what we know about the objects in the Solar System, we are better able to connect these meteorites with their parent bodies and better able to understand the formation and evolution of the Solar System. By categorizing living things into five kingdoms we can make sense out of the diversity of life. However, these classifications must be flexible as we gain new knowledge and make new discoveries. The discovery of extremophiles and the creation of a sixth kingdom, Archaeobacteria, is fundamental to the search for life on other planets/satellites in the Solar System.

Communicating our ideas with others is important to the process of science as well as a way of teaching what we know. Elementary school teacher Carolyn Hollis has said: "Having terms like gas giant, icy planets, rocky planets, helps me develop an appreciation for the diversity of forms planets take. Everyday words that evoke common attributes make mastering the vocabulary of astronomy easier." If the desire is to show how much more you know than the average person, then you should create labels that require advanced degrees to explain. "This will perhaps generate among the masses awe for brilliant astronomers. It will certainly keep peons from discussing the topic and make elementary teachers less comfortable with the subject."

Finally, Bill Schmitt, a science educator, has said: "The big issue is not if categories are right or wrong, but rather if they are helpful in understanding something." If the answer is no, then we need to look at a better categorization scheme.