Utah Mining Association

Earth Science Curriculum

Developed by University of Utah Mining Engineering students for the Utah Mining Association

Piloted and refined by Alpine School District teachers

Classify This!!!

Topic: Categorizing and classifying objects according to a simple system	Estimated Length (minutes): 45-80 minutes
7 Grade Standard 5, Students will understand that structure is used to develop classification systems	Objective: 2, Use and develop a simple classification system

Description:

- In this lesson students will learn how to create a simple classification system for non-living things.

Required Materials/Resources:

- 10 – 12 different common items that students in smaller groups can classify according to

the item's appearance or structure.
- 5 – 10 simple items to classify as a class
- Examples: shoes, writing implement, paper types, books, office supplies, random rocks, sea shells, balls, etc.

Introduction:

- A basic element of thinking is classification. We place objects and situations into conceptual categories in **order to make sense of the world.** By doing this we eliminate the need to respond to every object and situation as a completely new experience.
- We classify objects by choosing certain attributes to concentrate on while ignoring others. We cannot take in all attributes at once so we select just a few as being relevant to the task at hand. Classification of data is an important part of all scientific study.

Discussion: (Length: 10 minutes)

- Define a classification system
  - Discuss how things can be classified. Explain how objects can be classified according to many different properties or characteristics.
  - Discuss how there are multiple ways that objects can be classified and that just because one is different from another it doesn't make either right or wrong.
  - Give example of multiple ways to classify same set of object.
  - e.g. balls could be classified by size, shape, color, sport type, bounceability, etc.
  - Usually a dichotomous key would work best. For example a set of balls could be split into two groups first base on size, then by color, then by texture, exc.
  - Discuss the things that we classify everyday without even realizing it. This list could include things such as folders within folder on electronic devices (documents-->school-->science) Groupings students (School-->Grade level→ gender) mailing addresses (country --> state --> city), Facebook Friends (All friends → Close Friends → In a relationship).

Activity: Developing a classification system (Length: 10 – 15 minutes)

- As a class, develop a simple classification system on the set of 8 – 12 items. As this classification system is developed be sure to explain the thought process involved in creating the different categories and groups.

Assessment: Students develop a classification system (Length: 15 – 20 minutes)

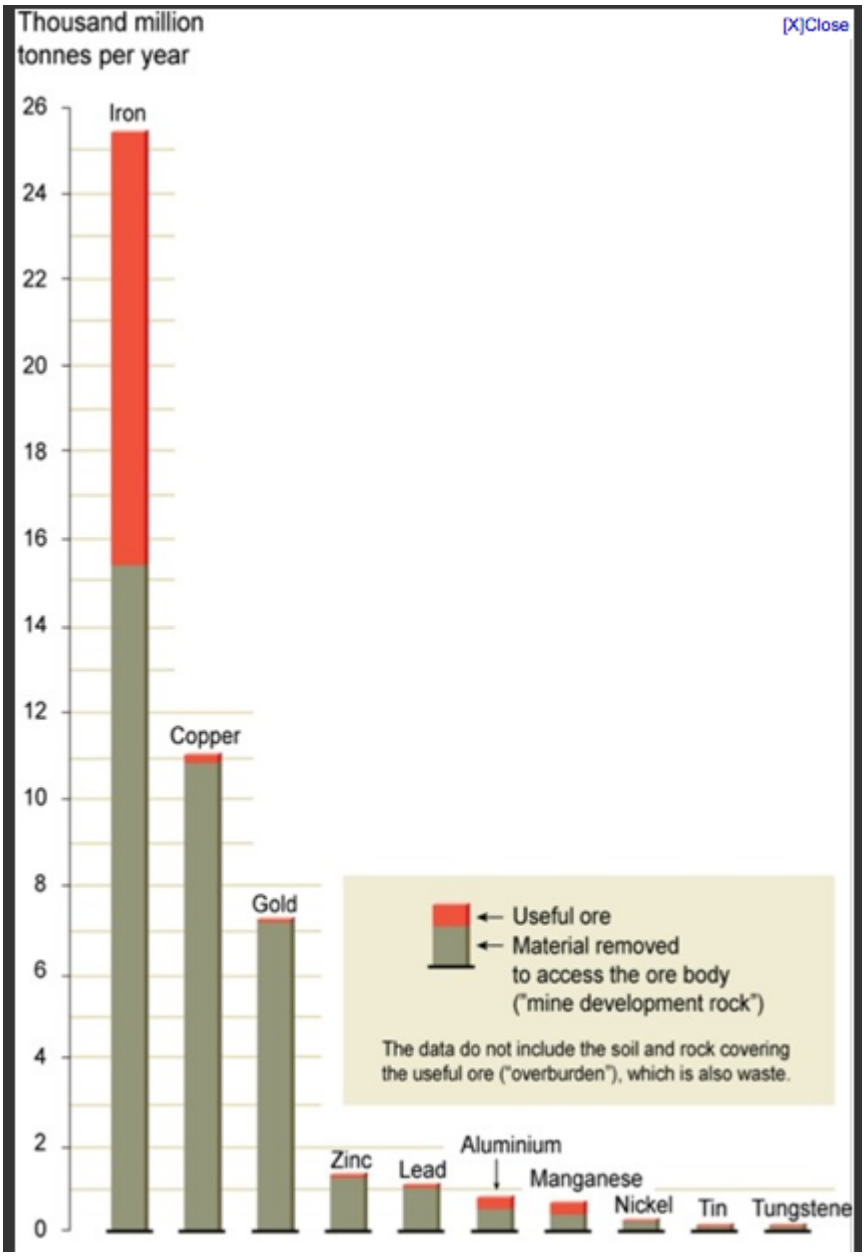
- Split the class up into groups with 4 – 6 students in each.
- Give each group a different set of objects to classify. (whatever you can find in your classroom)
- Have the students within their individual groups create a classification system in a similar manner as it was performed as a class. (10 minutes)

- Have groups rotate (trade object sets) to give students an opportunity to practice proficiency of skill of classification. Rotate as many times as time allows. (5 minutes each)
- Reinforce the fact that classification systems may differ, but that does not mean that one is right and the other is wrong.

Real World Application: (Length: 5 minutes)

- Discuss how classification systems are used in many different industries around the world.
- Explain that a major industry that uses classification extensively is the mining and minerals industry.
    - Explain the difference between ore vs. waste as it relates to mining. (Ore is what can be mined to actually be used, waste is what you go through to get to the usable material.) Discuss how this is a classification system and talk about the aspects that may determine whether a rock is ore or waste.

Image below shows “useful ore and material removed to access the ore”



- These things that define the classification of ore vs. waste may include things such as color, density, grade, etc.
- Density in relationships with Plate Tectonics- layers of the earth are classified based on their density (the more toward the center of the Earth you go, the more dense the material is)
- Sorting of Earth’s materials by size, density, water speed exc.
- Classification of Stars and Planets.