



Colegio de
San Francisco de Paula
NATURAL SCIENCES
DEPARTMENT

Laboratory Handbook

Year 10 Natural Science

Practical Session 6



Assessed criteria**Criteria E: AIE**

In all lab sessions you will be assessed for AIE: You will gain or lose points on this criteria based on your attitude in the laboratory, things like forgetting equipment, not listening to instructions will result in losing points: helping other students, cleaning up without being asked to, for example, will gain you points.

Criteria C: Processing and Evaluating**Research Question**

“How can I best present research and experimental data?”

Background Information

The Earth's crust provides us and many organisms a place to exist. The crust is an average of 35km thick under the continents (Newworldencyclopedia.org, 2014) and we exploit only a small fraction of it to extract useful minerals, compounds, travel through and build on.

Most modern devices rely on silicon, which makes up 27.7% of the Earth's crust (Encyclopedia Britannica, 2014), and many other minerals which need to be extract from the ground. The **infographic** below gives some information about what elements are needed from the ground to make an average smartphone. An infographic is a visual representation of a large amount of information, that allows users to quickly absorb the essential facts (Janssen, 2014).

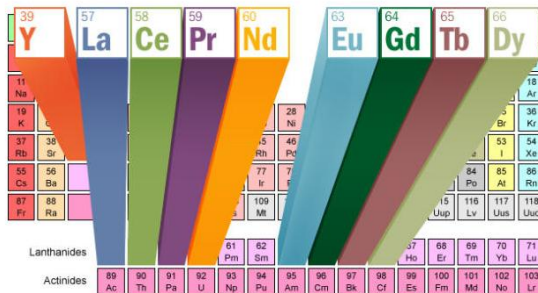
Consider the following website: <http://www.indiana.edu/~geol105/1425chap3.htm>. It is a university website so the information should be **peer-reviewed** and trustable, but what do you think of the presentation? There is a lot of information, but is it easy to extract the important areas?

Compare it to the following infographic:

THE PERIODIC TABLE OF IPHONES

Key ingredients in the iPhone include so-called **rare-earth minerals**, elements whose properties make it light, bright and loud.

Yttrium (39 Y)	Praseodymium (59 Pr)	Gadolinium (64 Gd)
Lanthanum (57 La)	Neodymium (60 Nd)	Terbium (65 Tb)
Cerium (58 Ce)	Europium (63 Eu)	Dysprosium (66 Dy)



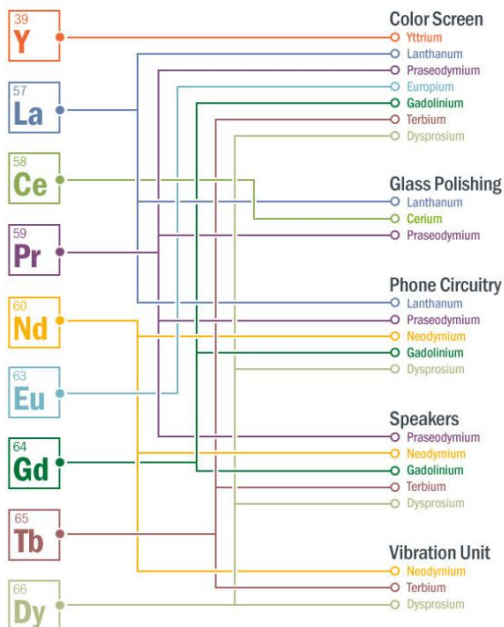
RARE-EARTH MINERALS

Right now, more than 90 percent of rare-earth minerals come from China, mostly because mining for rare-earth metals has been an environmental nightmare. But new processes are reviving rare-earth mining in the United States and elsewhere.



WHERE THEY END UP

If you look hard enough, an iPhone can be a lesson in high school chemistry. The device includes several rare-earth minerals that do everything from making the reds on the screen pop to having the phone vibrate when a call comes in.



The density of a rock is an important characteristic to know in order to understand how to extract the required elements or compounds; how to form foundations or build with it.

The density of a body can be calculated from its mass and the volume it occupies. The density of a rock can be determined by using a balance and a measuring cylinder.

Objective

To determine the density (g/cm³) of each sample of the most abundant rocks found in the Earth's crust. To research other relevant information and present data in the form of an infographic.

Materials

- Measuring cylinder
- Balance
- Water
- Magmatic rocks (granite and basalt)
- Metamorphic rocks (slate and marble)
- Sedimentary rocks (sandstone and clay)
- Infographic maker (See the following site for help and tools:
http://www.hongkiat.com/blog/infographic-tools/?asid=c228f21b&tmc=2pU0cgcdLX-vIO0EB1Cy_XZkiQ-XN74f38jAhCahwEQ)

Method

1. Construct an appropriate table to record the name, mass, volume, density and other observations of each sample.
2. Use the apparatus to record the mass and volume of each sample.
3. Record any other observations about the sample.
4. Calculate the density of each sample.
5. Collate results and produce an appropriate visualization.
6. Add further details to your infographic: For example (but not limited to!): percent composition of the sample, amount of sample in Earth's crust, uses, accepted densities and characteristics.
7. Critically consider and reference your sources correctly.

Results

Insert your infographic here.

References

Encyclopedia Britannica, (2014). silicon (Si) (chemical element). [online] Available at: <http://global.britannica.com/EBchecked/topic/544301/silicon-Si> [Accessed 21 Jul. 2014].

Janssen, C. (2014). What is an Infographic? - Definition from Techopedia. [online] Techopedia.com. Available at: <http://www.techopedia.com/definition/27808/information-graphic-infographic> [Accessed 21 Jul. 2014].

Newworldencyclopedia.org, (2014). Rock (geology) - New World Encyclopedia. [online] Available at: [http://www.newworldencyclopedia.org/entry/Rock_\(geology\)](http://www.newworldencyclopedia.org/entry/Rock_(geology)) [Accessed 21 Jul. 2014].