Mini Unit – Earth, Rocks and Minerals, and Soil

Earth’s Layers
Major Concepts: Earth is layered, Models
Minor Concepts: Convection Currents, Magnetosphere
   Concepts Skills
Vocabulary: Inner core Models
          Outer core
          Mantle
          Moho
          Crust
          Continental crust
          Oceanic crust
          Convection current
          Magnetosphere
          Magma

Core Content
SC-M-2.1.1 The Earth is layered … There is a dense core at the center of the Earth.

Program of Studies
Grade 7 Scientific Inquiry – Use evidence, logic, and scientific knowledge to develop scientific explanations.
Earth/Space (Structure of the Earth’s System) Student’s will model Earth’s layers.

Pretest on Lithosphere and Earth’s Interior – after student’s finish I read them passages from Journey to the Center of the Earth.

   Materials for 1 classroom demonstration
Core – Solid food. I usually use chocolate fudge or chocolate candy melt. I prepare it and place it in a small bowl to harden overnight.
Outer Core – 1 ½ Jars of large marshmallow cream.
Mantle – 1 large box of red Jell-O. Prepared
Moho – 2 small bars of white candy making chocolate
Crust – 1 box of crushed graham crackers.

Demonstration
(To do this demonstration I come dressed as a chef –known as Donna Meryl)
As the kids enter the room they know something different is about to happen. I have their immediate attention.

   Donna Meryl’s Recipe for making Earth
1. Inner Core – I begin by putting a large clear pan on my desk. Then I put the small chocolate inner core into the pan. I pick a student to record notes on the board as I talk about the layers of the Earth. I require students to
copy notes. The first question asked is what is that? Once I tell them, the next question is do they get to eat the core. I reply it all depends on how well they listen and learn. I then begin telling all kinds of facts about the inner core, i.e. made of nickel and iron, spins, scientists believe it produces the magnetosphere, etc.

2. Outer core – Next, I get out the marshmallow cream and cover the inner core, discussing facts about the outer core.

3. Mantle – Next Jell-O discussing convection currents within the mantle.

4. Moho – I melt the candy making chocolate as I discuss the inner parts of the Earth. I then pour the melted chocolate on top of the Jell-O and it hardens quickly, discussing the known facts about the Moho.

5. Crust – Finally, I pour the crushed graham crackers on top, thick to represent the continental crust, thin for ocean crust. I discuss facts about the crust.

At the end I ask for questions and erase the board. I have the students put up their notes and tell them they will need them the next day. I then ask questions about the lesson.

Then I get out bowls and spoons and let them eat Earth. They love it.

Day 2

The next day I put the students into groups and have them get out their notes. I give them lots of modeling clay and have them to make a model of the Earth. That’s all I tell them. Let them figure out how to do it. You get all kinds of designs and models. They must make a key and write fact notes about the different layers. I place the models on tag board and display them.

I follow this with lessons on the lithosphere. That then leads us into rocks and minerals.
1. The softest mineral in the Mohs hardness scale is ________________
   a. fluorite  b. talc  c. diamond  d. calcite

2. The two most common elements in the Earth's crust are ________________
   a. oxygen and silicon  c. sodium and iron
   b. oxygen and nitrogen  d. aluminum and magnesium

3. Elements that have shiny surfaces and are able to conduct electricity and heat are called ________________
   a. metals  b. nonmetals  c. ores  d. gemstones

4. The breaking of a mineral along smooth definite surfaces is called ________________
   a. cleavage  b. fracture  c. splintering  d. foliation

5. The Earth's inner core is made of ________________
   a. oxygen and silicon  c. iron and silicon
   b. iron and nickel  d. copper and nickel

6. The thinnest outer layer of the Earth is called the ________________
   a. mantle  b. Moho  c. crust  d. core

7. The layer that makes up most of the Earth's mass and volume is the ________________
   a. mantle  b. magma  c. crust  d. core

8. Two plates grind past each other at a ________________
   a. constructive boundary  c. convergent boundary
   b. divergent boundary  d. strike-slip boundary

9. Plates containing crust and upper mantle form the Earth's ________________
   a. lithosphere  c. core
   b. hydrosphere  d. atmosphere

10. In the diagram shown below, which rock layer is probably the oldest?
    a. layer 1  b. layer 2  c. layer 5  d. layer 6

11. The collision of two oceanic plates creates ________________
    a. mountain belts  c. rift valleys
    b. convection currents  d. island arcs
12. Evidence that supports the theory of continental drift has been provided by ___________  
   a. coal fields               c. fossils  
   b. glacial deposits         d. all of these  

13. The process in which the ocean floor plunges into the Earth’s interior is called ___________  
   a. construction    b. subduction    c. rifting      d. convection

14. The movement of the ocean floor on either side of a midocean ridge is best known as ___________  
   a. rifting          b. glaciation    c. ocean-floor spreading d. subduction

15. Metamorphic rocks with mineral crystals arranged in parallel layers, or bands, are ___________  
   a. clastic          b. intrusive    c. porphritic    d. foliated

16. The way in which a mineral reflects light from its surface is its ___________  
   a. streak          b. luster      c. fracture     d. brilliance

17. Which rocks can be changed into sediments by weathering and erosion ___________  
   a. sedimentary    b. igneous     c. metamorphic d. all of these

18. Which of these is an example of an intrusive rock ___________  
   a. granite        b. basalt      c. shale       d. obsidian

19. The shape of an organism preserved in rock is called ___________  
   a. mold/cast      b. coprolite   c. imprint     d. petrification

20. Bodies of whole animals have been preserved in ___________  
   a. ice          b. tar         c. amber      d. all of these

21. Rocks formed from the piling up of layers of dust, dirt, and sand are called ___________  
   a. igneous      b. metamorphic c. magma       d. sedimentary

22. The decay rate of a radioactive element is measured by a unit called ___________  
   a. period       b. era         c. half-life   d. unconformity

23. Dinosaurs found at the Bone Cabin Quarry lived during the ___________  

24. A measure of how many years ago an event occurred or an organism lived is ___________  
    a. absolute age b. relative age c. decay time d. sedimentary age

25. Name the eight properties used to identify minerals.  
   1. ______________________  
   2. ______________________  
   3. ______________________  
   4. ______________________  
   5. ______________________  
   6. ______________________  
   7. ______________________  
   8. ______________________
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23. Dinosaurs found at the Bone Cabin Quarry lived during the
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   b. Jurassic Period
   c. Cretaceous Period
   d. Tertiary Period

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25. Name the eight properties used to identify minerals.
   
   1. **Luster**
   2. **Color**
   3. **Density**
   4. **Crystal**
   5. **Streak**
   6. Fracture/cleavage
   7. **Hardness**
   8. **Special Properties**