8th Grade Science Resource Book

Unit 3: Earth Science

Mrs. Antkowiak and Mrs. Brevetti

Table of Contents:-

Life Principles

Responsibility – making the choice to be reliable and dependable

Respect – feeling honor

Self-discipline – the ability to choose and control one's own actions

Honesty – truthfulness

Integrity – acting according to a sense of right and wrong

Courage – strength to act even when afraid or uncertain

Compassion – ability to persist or continue striving to the end

Loyalty – faithfulness to another

Effort – doing one's best in an endeavor

Friendship – caring for and trusting others

Cooperation – working together

Common Sense – thinking before acting; using good judgment

Flexibility – ability to make adjustments or alter plans

Initiative – taking action; originating new ideas

Curiosity – desire to learn, to explore, to investigate

Patience – ability to wait calmly

Problem-Solving – creating solutions; finding answers

Justice – being fair, right, and upholding what is right

Commitment – keeping a promise or a pledge

Esprit de Corps – devotion among members of a group for each other and the group's purpose

Citizenship – behaving in a responsible manner as a citizen of a community

Service – giving of one's time and energies to help others

Fortitude – strength of mind that enables a person to encounter danger or bear pain or adversity with courage

Optimism – an inclination to put the most favorable construction upon actions and happenings or to anticipate the best possible outcome

Humanitarianism – promotion of human welfare and social reform

Propriety – standard of what is socially acceptable in conduct or speech

Courtesy – consideration, cooperation, and generosity

Temperance – moderation in action, thought, or feeling

Dedication – complete and wholehearted devotion, especially to a purpose, ideal, or role in life

Humility – being humble, not proud or haughty, not arrogant or assertive

Empathy – capacity for participating in another's feelings or ideas

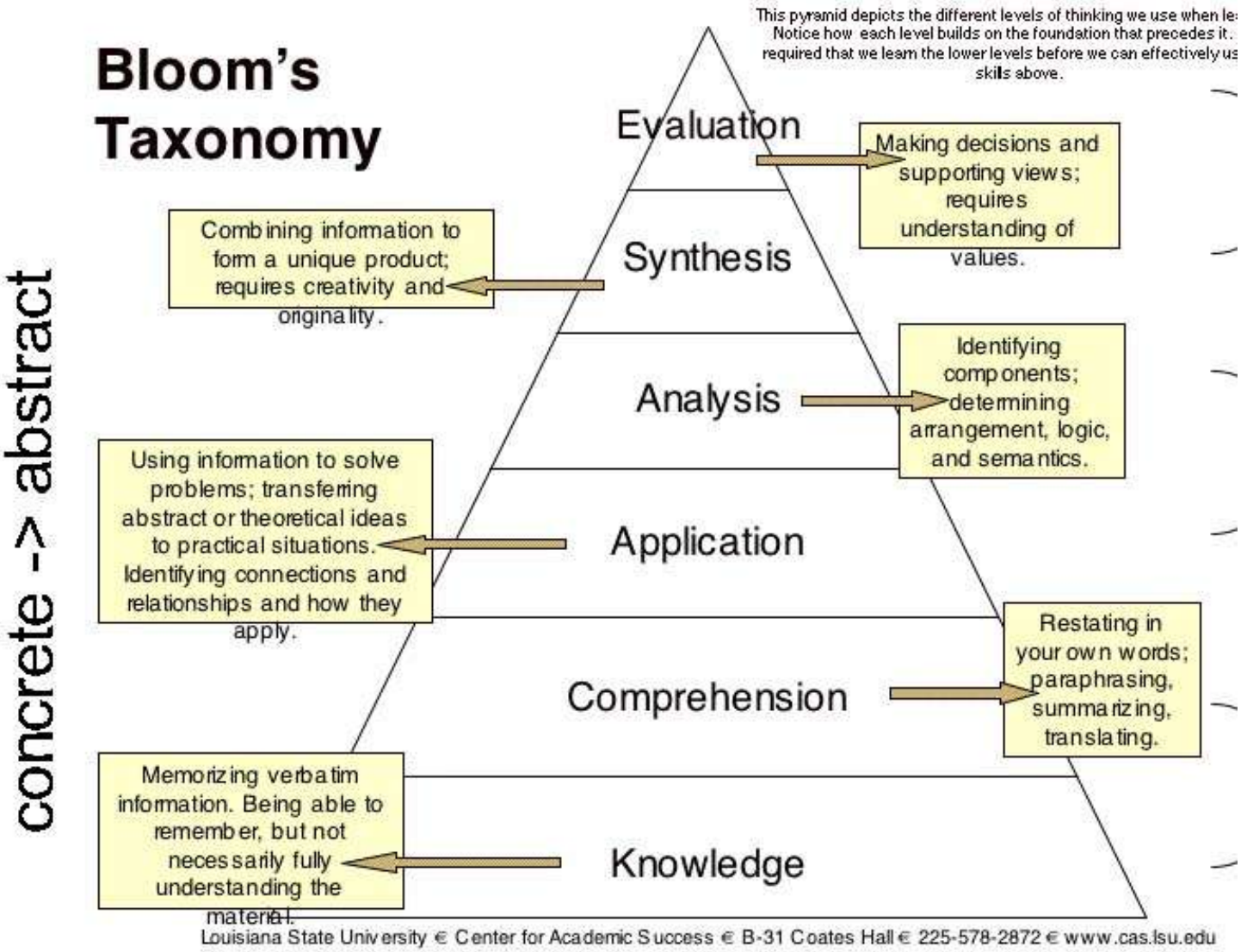
Forgiveness – act of forgiving for an offense; pardoning

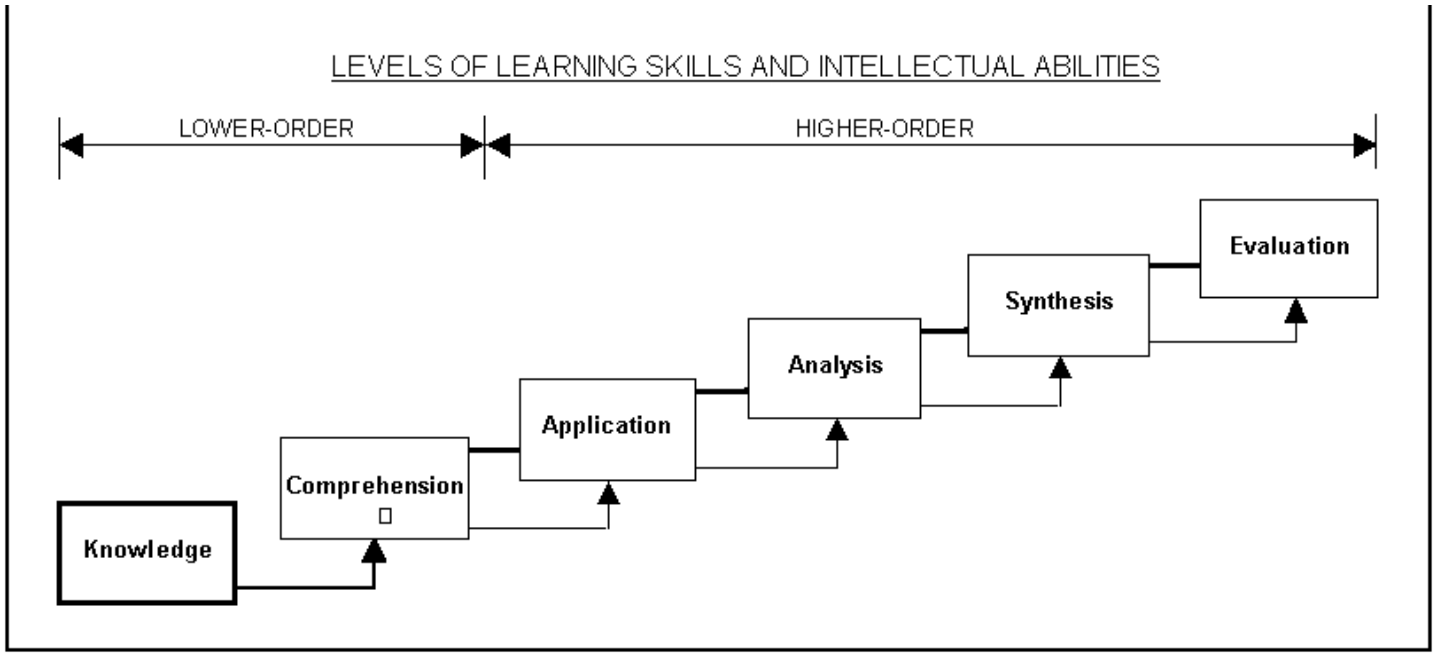
Sincerity – honesty of mind; freedom from hypocrisy

Patriotism – love for or devotion to one's country

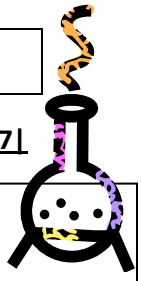
Resiliency – recovering from or adjusting easily to misfortune or change

Bloom's Taxonomy of Higher-Oder Thinking





8th Grade Science Antkowiak/Brevetti



Contact Information: Antkowiak ext. 4683 | Brevetti ext. 5507|

Learning Goals: (National Science Standards)

1. **Learn how to identify and ask appropriate questions that can be answered through scientific investigations.**
2. **Design and conduct investigations to collect the evidence needed to answer a variety of questions**
3. **Use appropriate equipment and tools to interpret and analyze data**
4. **Learn how to draw conclusions and think crucially and logically to create explanations based on your evidence.**
5. **Communicate and defend your results to your peers and others**

Daily Supplies: You are *required* to bring your composition notebook, your provided lab resource manual, your science folder, and your pencil-case supplies daily. Do not bring or purchase a binder for science class. You may purchase a pouch or pencil case in which to keep your scissors, glue, colored pencils, pencils, and checking pens. These items are required to come to class DAILY.

Classroom Procedures: Choose your attitude. Treat everyone with courtesy and respect- as long as that's handled, then have fun! Come prepared every day. All work must be neatly done. It is our expectation that students will use complete sentences when writing and speaking. This will be modeled for them by Mrs. A and Mrs. B.

Each day when you enter the room Be in your seat when class starts. There are no bells but our class will start on time. The door will be closed and locked when it is time for class. The teacher will also keep a record of your tardies. Check the board for instructions DAILY!

Tardies-1st and 2nd: Warning
3rd and up: detention/parent contact
5th +: detention and further administrative action

Teacher Websites: Your most valuable resource is your teacher's website. It will have any handouts, notes, power points, etc. available to you. Extra copies of any handouts will not be made, and if yours is lost you may download a new one. Expect to access the website daily for class information and updates. If you do not have a computer at home, you may access the website during lunch or after school with a teacher pass and print off what you need. You will be expected to check your grades weekly on PIV. It is important that you identify any missing work that needs to be completed and get that work done within the unit of study. If you do not have access to a computer at home you may print out grade reports in the library.

Technology: Technology will play a big part in our class. We will use cameras, video-recorders, cell phones (with teacher direction, support, and monitoring) on occasion.

Organization: Please have your supplies with you daily. Students and parents will be notified either via email, on the class website or in the classroom of any deadlines or due dates within a unit of study. All late or absent daily work/labs/late assignments/ will **not be accepted after the unit of study has been completed**.

Taking Work Home: The best policy is get the work totally done to your best ability in class. If you are having trouble with your school work we want you in for help. It is very important you have a strong grasp of science skills and content. There will be few assignments this year that will not be completed in class. Alternate assignments or make-up lab work will most likely require at-home completion.

Quiz/Test Re-Take Options: Students will have 5 school days from the time they are notified of their grade on an assessment to obtain and complete the retake form and make an appointment for reassessment. The teacher and the student will agree upon a time that works for both of themselves to retake the assessment. The student will receive the higher of the two grades. If a student waits more than one week after the assessment has been given he/she will not be granted a retake of the assessment and will keep the grade earned.
Students are responsible for taking their own initiative and printing off their own copy of the retake form and fully completing this form (i.e. get it signed by a parent or guardian) before the teacher will give an opportunity for a retake.

Lab Attitude: Lab is a privilege. If you cannot participate appropriately there will be an alternative assignment that will address the same standards and content of the lab. There will be NO HORSEPLAY. The data that you get from the lab is shared by partners. Predictions, evaluations, and conclusions should be done in your own words with your own thoughts, in complete sentences.

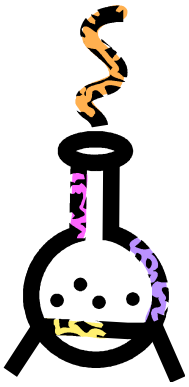
You will be expected to clean up before you leave class. If you want to avoid after school detention/cleaning time be sure that you don't leave your group stranded at the end of a lab. You will be released by your teacher when your lab station is clean.

Making Up Labs: There will be notice given for any lab or lab activities done in the classroom and if students are absent on a given lab day, they will be given an alternative assignment that addresses the same concepts covered in the lab. If the first day of a lab is missed, but not others, it is at the teacher's discretion to insert student into an already formed lab team, or assign the alternate assignment.

Class Grades: Class grades this year will be standard-based. Please see your class website for further details on specific power standards being assessed throughout the school year.

Projects: Will be announced ahead of time and planned by the 8th grade science teachers. Don't wait till the last minute to get your materials needed for the project. Project deadlines will be set along the way, and most projects will include a grade that assesses the student's ability to meet these deadlines.

Safety Test/Safety Contract: **Students** are required to complete, sign and return safety contracts AND take and pass a safety test with higher than a 90% before they will be allowed to participate in any classroom lab. Our first lab this year will take place within the first 5 days of school. ***Therefore, Safety Contracts and any make-up tests will need to be completed the deadline set by your child's science teacher***. Those not in compliance will be given an alternative assignment until both requirements have been met.



Flinn Scientific's Middle School Science Safety Contract

PURPOSE

Science is a hands-on laboratory class. However, science activities may have potential hazards. We will use some equipment and animals that may be dangerous if not handled properly. Safety in the science classroom is an important part of the scientific process. To ensure a safe classroom, a list of rules has been developed and is called the Science Safety Contract. These rules must be followed at all times. Additional safety instructions will be given for each activity.

No science student will be allowed to participate in science activities until this contract has been signed by both the student and a parent or guardian.

SAFETY RULES

1. Conduct yourself in a responsible manner at all times in the science room. Horseplay, practical jokes, and pranks will not be tolerated.
2. Follow all written and verbal instructions carefully. Ask your teacher questions if you do not understand the instructions.
3. Do not touch any equipment, supplies, animals, or other materials in the science room without permission from the teacher.
4. Perform only authorized and approved experiments. Do not conduct any experiments when the teacher is out of the room.
5. Never eat, drink, chew gum, or taste anything in the science room.
6. Keep hands away from face, eyes, and mouth while using science materials or when working with either chemicals or animals. Wash your hands with soap and water before leaving the science room.
7. Wear safety glasses or goggles when instructed. Never remove safety glasses or goggles during an experiment. There will be no exceptions to this rule!
8. Keep your work area and the science room neat and clean. Bring only your laboratory instructions, worksheets, and writing instruments to the work area.
9. Clean all work areas and equipment at the end of the experiment. Return all equipment clean and in working order to the proper storage area.
10. Follow your teacher's instructions to dispose of any waste materials generated in an experiment.
11. Report any accident (fire, spill, breakage, etc.), injury (cut, burn, etc.), or hazardous condition (broken equipment, etc.) to the teacher immediately.
12. Consider all chemicals used in the science room to be dangerous. Do not touch or smell any chemicals unless specifically instructed to do so.
13. Handle all animals with care and respect.
    a. Open animal cages only with permission.
    b. Never handle any animals when the teacher is out of the room.
    c. Do not take animals out of the science room.
    d. Do not tease or handle animals roughly.
    e. Keep animals away from students' faces.
    f. Wear gloves when handling animals.
    g. Report any animal bite or scratch to the teacher immediately.
14. Always carry a microscope with both hands. Hold the arm with one hand; place the other hand under the base.
15. Treat all preserved specimens and dissecting supplies with care and respect.
    a. Do not remove preserved specimens from the science room.
    b. Use scalpels, scissors, and other sharp instruments only as instructed.
    c. Never cut any material towards you—always cut away from your body.
    d. Report any cut or scratch from sharp instruments to the teacher immediately.
16. Never open storage cabinets or enter the prep/storage room without permission from the teacher.
17. Do not remove chemicals, equipment, supplies, or animals from the science room without permission from the teacher.
18. Handle all glassware with care. Never pick up hot or broken glassware with your bare hands.
19. Use extreme caution when using matches, a burner, or hot plate. Only light burners when instructed and do not put anything into a flame unless specifically instructed to do so. Do not leave a lit burner unattended.
20. Dress properly—long hair must be tied back, no dangling jewelry, and no loose or baggy clothing. Wear aprons when instructed.
21. Learn where the safety equipment is located and how to use it. Know where the exits are located and what to do in case of an emergency or fire drill.

AGREEMENT

I, _____, (student's name) have read and understand each of the above safety rules set forth in this contract. I agree to follow them to ensure not only my own safety but also the safety of others in the science classroom or laboratory. I also agree to follow the general rules of appropriate behavior for a classroom at all times to avoid accidents and to provide a safe learning environment for everyone. I understand that if I do not follow all the rules and safety precautions, I will not be allowed to participate in science activities.

_____
Student Signature

_____
Date

Dear Parent or Guardian:

We feel that you should be informed of the school's effort to create and maintain a safe science classroom/ laboratory environment. Please read the list of safety rules. No student will be permitted to perform science activities unless this contract is signed by both the student and parent/guardian and is on file with the teacher. Your signature on this contract indicates that you have read this Science Safety Contract, reviewed it with your child, and are aware of the measures taken to ensure the safety of your son/daughter in the science classroom.

_____
Parent/Guardian Signature

_____
Date

Important questions:

Does your child wear contact lenses?
Y or N

Is your child color blind?
Y or N

Does your child have any allergies?
Y or N

If so, Please list:

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P.O. Box 219, Batavia, IL 60510
1-800-452-1261 • Fax: (866) 452-1436
flinn@flinnsci.com • www.flinnsci.com

Science Safety Symbols

Disposal Alert

This symbol appears when care must be taken to dispose of materials properly.

Biological Hazard

This symbol appears when there is danger involving bacteria, fungi, or protists.

Open Flame Alert

This symbol appears when use of an open flame could cause a fire or an explosion.

Thermal Safety

This symbol appears as a reminder to use caution when handling hot objects.

Sharp Object Safety

This symbol appears when a danger of cuts or punctures caused by the use of sharp objects exists.

Fume Safety

This symbol appears when chemicals or chemical reactions could cause dangerous fumes.

Electrical Safety

This symbol appears when care should be taken when using electrical equipment.

Plant Safety

This symbol appears when poisonous plants or plants with thorns are handled.

Animal Safety

This symbol appears whenever live animals are studied and the safety of the animals and the students must be ensured.

Radioactive Safety

This symbol appears when radioactive materials are used.

Clothing Protection Safety

This symbol appears when substances used could stain or burn clothing.

Fire Safety

This symbol appears when care should be taken around open flames.

Explosion Safety

This symbol appears when the misuse of chemicals could cause an explosion.

Eye Safety

This symbol appears when a danger to the eyes exists. Safety goggles should be worn when this symbol appears.

Poison Safety

This symbol appears when poisonous substances are used.

Chemical Safety

This symbol appears when chemicals used can cause burns or are poisonous if absorbed through the skin.

ABC'S OF GRAPHING 8TH GRADE SCIENCE

Steps to making a line graph

1. Write your name, block and date of assignment at the upper right hand corner of paper.
2. Never use **marker** on a graph, only use pencil/colored pencils. Use a straight edge in your work.
3. Label the X and Y axis. The X axis is the cause/horizontal/independent variable. The Y axis is the effect/vertical/dependent variable.
4. Give your Graph a title. The title should include the independent and dependent variable. Make sure your title is very descriptive and tell the cause/effect in it so the reader can understand what the graph is about.
5. Label the units both for the independent and dependent variables.
6. Break up the graph and find your highest value that you have to put down for both your Y and X. Divide that value by the number of boxes you have to work with. (Don't worry; you'll rock on this eventually!)
7. The X is always the independent variable (treatment/cause) and the Y is always the dependent variable (result of the experiment/effect)
8. Use the entire page of graph paper, make the line graph as large as possible, it is easier to read and understand.
9. Line graphs are used for data that WILL CHANGE OVER TIME AND NOT STAY THE SAME!

Lab Clean Up Check List

All of these must be done before

TAKING OFF YOUR GOGGLES!

☆ Put away lab equipment/supplies

☆ Clean and dry lab station

☆ Clean and dry floor around lab station

☆ Wash your hands with soap and water

☆ All group members back to the station

ONLY AFTER **ALL** OF THESE HAVE BEEN DONE

THEN RAISE YOUR HAND FOR PERMISSION TO

TAKE OFF YOUR GOGGLES.

BEFORE LAB

☺ **everything off your lab table**

☺ **Only have lab notebook out**

☺ **Tie back hair**

☺ **SPIT OUT GUM!**

☺ **Closed toed shoes!**

☺ **everything out of the aisles**

☺ **Goggles on!**

*** If goggles don't fit or are uncomfortable move away from your lab station, go by the door and adjust them!**

(Removal from the lab may occur if you do not follow these specific directions ☺)

Edmond Public Schools

Recommended Science Laboratory Format

The following format may vary based on grade level, experiment, and level of inquiry.

Title

Observations: What did you see? Both Qualitative and Quantitative.

Problem or Question: Derived from observations

Research- Questionable information which may arise from observing a phenomenon that requires more scientific support before designing the investigation.

Hypothesis: If….. then…. because… (What is your explanation for something that you observed that you did not expect to see? Write what you expect for the outcome of your test.)

Variables: Independent, Dependent, Control, and Constants
Write your independent and dependent variables. Your independent variable is what you as a scientist are changing. Your dependent variable is what you observe during the experiment and /or measure that happens as a result of the independent variable. It "depends" on the independent variable. Also, write about what other possible variables could occur that you will control in order to ensure a fair test.

Materials and Safety
Procedures What will you do to test your explanation? Write in one sentence how you will test your explanation. Then write a procedure.

Data Collection: Tables, Graphs, Charts, Diagrams, Photos, etc.
Create a data table? Draw sketches? You need to decide before you start your experiment. Create some table to be able to record you data during your experiment. Make sure you record observations and perhaps draw some sketches to collect as much information as you can during your test.

Data Analysis, Conclusion, and Communicate (Report and Reflect): Students should draw conclusions from their data and explain what it says about their experiment. Further explanation of how it supports or does not support the hypothesis and why or why not is also important.
What did you find in your experiment? What did you learn? Create a graph or visual to help you analyze your experiment. Did your predicted outcome occur? Is your hypothesis supported or unsupported? Do you need to revise your hypothesis? What would you do differently next time? What will you tell others about your experiment? What contributions can be made based on what you learned from you work?

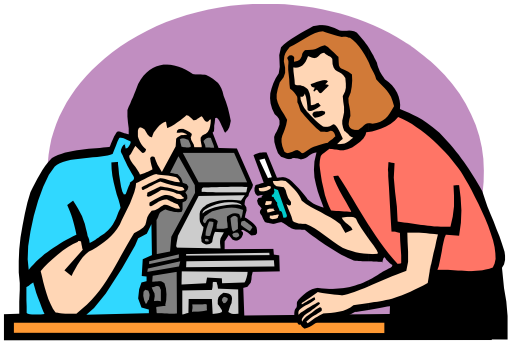
Extension: Future testing or further research

Edmond Public Schools
Recommended Science Laboratory Format

College Board Recommends:
It is important for all students to keep record of their laboratory experiences in a lab notebook as evidence of their experiences in a laboratory course.
The recommended components and skills of the labs should include:

- Understanding Problems
- Developing Hypotheses
- Design and implement controlled experiments
- Identify independent and dependent variables
- Analyze Data
- Draw Conclusions
- Think Analytically
- Communicate Results with appropriate data tables and graphs.

All of the components above can be easily supported by our middle school and high school science course through different levels of inquiry. All of our current high school courses are considered laboratory credit for graduation and students should be practicing good laboratory skills by keeping a record of their laboratory experiences through lab reports or lab notebooks.



Experimental Design Planning Sheet

Use this design to help guide you in your experiment.

The question we are investigating is:

Our prediction is:

Materials we will use are (including measurement tools):

Hypothesis:

Independent Variable:

Dependent Variable:

Our controlled variables (things we kept the same in our experiment) are:

Step by Step Procedures:

D.5: Earth's History:

Geologic Time Scale (ch. 23.1)

Fossils (ch. 23.1 & 21.1)

Layers of the Earth (ch.13.1 & 18.1)

*It is the expectation of 8th grade science students to get missing notes or information from a friend, the website, or the corresponding sections of the textbook. Class notes will occasionally come from the textbook, however not all information used is from this resource. PowerPoints used in class are posted on the class website.

Earth's History Vocabulary Terms

Geologic Time Scale

James Hutton
Geologic Time Scale
Eon
Epoch
Era
Period
Theory of Uniformitarianism
Holocene Epoch

Fossils

Fossils
Original Remains
Tar
Amber
Sedimentary Rock
Igneous Rock
Molds
Casts
Petrified Wood
Carbon Films
Trace Fossils
Relative Dating
Absolute Dating
Fossil Record
Mass Extinctions
Permian Extinction
Cretaceous Extinction
Theory of Superposition

Layers of the Earth

Geosphere
Hydrosphere
Biosphere
Atmosphere
Crust
Inner Core
Outer Core
Mantle
Open System
Closed System
Tectonic Plates

Chapter 21 Investigation

Geologic Time

MATERIALS

- Geologic time scale conversion chart
- Adding machine paper 5 meters long
- Scissors
- Colored markers, pens, or pencils
- Metric tape measure or meter stick
- Sticky notes

PURPOSE

In this investigation you will

- Make a scale model of the geologic time scale
- Put fossils, organisms, and geologic events in the right place on the timeline

PROCEDURE

Check off each step as you do it.

❑ ❶ Complete the geologic time scale conversion chart.

a. Fill in the Measurement column for eons in Table 1. Use the scale 1 mm = 1 million years to convert years to meters or centimeters.

TABLE 1. GEOLOGIC TIME SCALE CONVERSION CHART

Divisions of Geologic Time	Millions of Years Ago It Began	Measurement
Eons		
Hadean	4600	4.6 meters
Archean	3800	
Proterozoic	2500	
Phanerozoic	544	
Eras		
Paleozoic	544	54.4 centimeters
Mesozoic	248	
Cenozoic	65	
Periods		
Cambrian	544	54.4 centimeters
Ordovician	490	
Sulurian	443	
Devonian	417	
Carboniferous	354	
Permian	290	

Triassic	248	
Jurassic	206	
Cretaceous	144	
Tertiary	65	
Quaternary	2	
Epoch		
Paleocene	65	6.5 centimeters
Eocene	55	
Oligocene	34	
Miocene	24	
Pliocene	5	
Pleistocene	2	
Holocene	.01	

b. When the number in column 2 is 1000 or more, convert to meters. To convert the number to meters, divide the number by 1000.

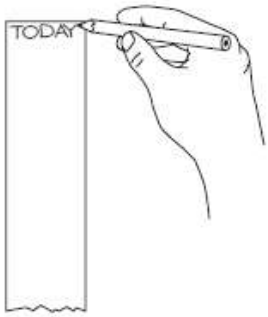
3800 Million Years Ago ÷ 1000 = 3.8 meters

c. When the number in column 2 is less than 1000, convert to centimeters. To convert the number to centimeters, divide by 10.

544 Million Years Ago ÷ 10 = 54.4 cm

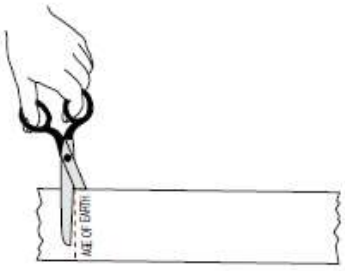
d. Repeat steps a and b above for eons, eras, periods, and epochs.

❑ ❷ Measure the length of your model. Lay the paper out in front of you.



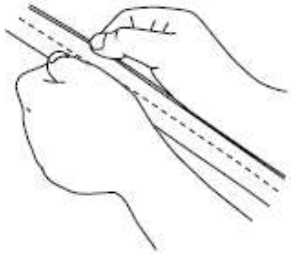
a. At the far right end of the strip, write TODAY lengthwise, as shown.

b. Measure back 4.6 meters (4600 million years) from the TODAY mark.

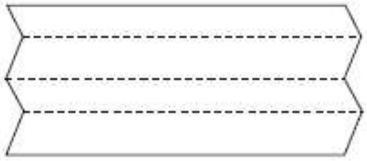


c. Label this point AGE OF EARTH. Cut off the excess paper.

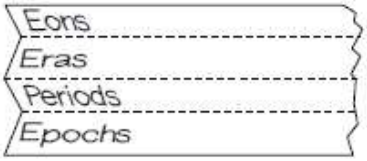
❑ ❸ Make and label the geologic time scale model.



a. Fold the paper in half lengthwise once. Fold it in half lengthwise again.



b. Open the paper. The creases should divide it into four rows.



c. At the far left end of the strip, label each of the four rows as shown.

❑ ❹ Mark eons on your model. Use the numbers from your chart.

- Measure backward with your tape measure or meter stick from the TODAY mark for each eon. For example, the Archean eon started 3800 million years ago. So measure back 3.8 meters from TODAY.
- Make a vertical line to mark the distance from TODAY.
- Write "Archean Eon" within this space.
- Repeat these steps for the other eons.

❑ ❺ Repeat all of step 4 for eras, periods, and epochs.

❑ ❻ Draw pictures of fossil organisms and geologic events on the model. Use the same way of measuring to add the fossils and events from Table 2.

- Draw a picture for each fossil or event on the timeline.
- Write each fossil's name or each event on a separate sticky note

TABLE 2. IMPORTANT EVENTS IN EARTH'S HISTORY

Fossil and Event	Time (millions of years ago)
First trilobite	554
First mammal	210
Greatest mass extinction	248
First green algae	1000
Early humans	2
Extinction of dinosaurs	65
First life forms	3800
Flowering plants	130

Observe and Analyze

1. **Compare and Contrast** The time from 4.6 billion years ago until the beginning of the Phanerozoic era is called Precambrian time. Find the part of your time scale that represents Precambrian time.

   What do you notice when you compare the length of Precambrian time with all the other areas in the geologic time scale combined?

   _____

2. **Compare and Contrast** How does the era that includes the present—the Cenozoic era—compare in length with the other eras?

   _____

3. **Interpret** Where are the two main extinction events on your timeline?

   _____

4. **Infer** What do the locations of the two main extinction events tell you about how geologists divided the time scale into smaller units?

   _____

   _____

Conclude

1. **Interpret** Where are most of the life forms on your timeline grouped?

   _____

   _____

2. **Infer** How does this pattern help explain why the shortest era on the timeline has been divided into so many smaller divisions?

   _____

3. **Evaluate** What limitations or difficulties did you have in making or interpreting this model of the geologic time scale?

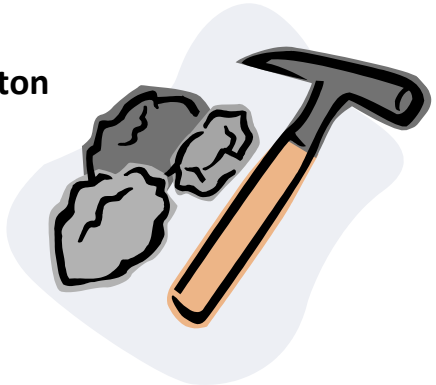
   _____

4. **Apply** Think about the relationship between fossils and rock layers. Explain why the geologists who first made the geologic time scale found it difficult to divide the first three eons into smaller time divisions.

   _____

   _____

21.3 Notes: Geologic Time Scale and James Hutton



I. Earth is constantly changing

a.

i. Theory of Uniformitarianism

ii.

II. The Geologic Time Scale divides Earth's history

a. Divisions of Geologic time

i.

ii.

iii.

iv.

b. Phanerozic Eon:

i. Paleozoic Era:

1.

2.

ii. Mesozoic Era:

1. Dinosaurs

a.

b.

iii. Cenozoic Era:

1.

2.

3.

Additional Notes (from PowerPoint):

Artifacts PowerPoint

Directions: Observe the slides on the powerpoint very carefully. Take note of dates, surrounding environment, and any other organisms in the recovered evidence. The organism on which you will be asked to focus is circled in each slide. Use your observations to make predictions about the artifact.

Tell me about the organisms:

1) AGE:

2) FAMILY

3) LIKES/DISLIKES?

4) HOBBIES/ACTIVITIES?

5) TRADITIONS/CULTURE?

6) JOB(S)?

7) Was there evidence for every year of the organisms life? Can you infer anything about missing pieces of evidence?

21.1 Notes: Fossils

I. Rocks, Fossils, and Original Remains give clues about the past.

a. Fossils:

i.

ii.

b. Original Remains:

i. Ice-

ii. Amber-

iii. Tar-

c. Fossil Formation

i.

ii.

iii.

d. Fossils in Rocks

i. Molds:

ii. Casts:

iii. Petrified wood:

iv. Carbon Films:

v. Trace Fossils:

II. Fossils and other natural evidence show changes in life and the environment

a.

i.

b.

i.

23.1 Notes: Fossils

I. Living things have been around for 3.8 billion years.

a.

i. Types of Fossils

1.

a.

2.

3.

ii. Finding the age of fossils

1. Relative dating compares

2. Absolute dating uses

iii. The fossil record

1.

2.

3.

b. More complex organisms developed over time.

   i. Unicellular organisms

   ii. Multicellular organisms

      1.

   iii. Life on Land

      1.

      2.

      3.

c. Earth's history includes mass extinctions

   i. Mass extinctions:

   ii. Permian extinction:

   iii. Cretaceous Extinction:

CHAPTER 21 | ADDITIONAL INVESTIGATION A

Fossils

PURPOSE

In this investigation you will

- make model fossils
- distinguish between a mold and cast fossil
- describe the differences between mold and cast fossils

MATERIALS

- modeling clay
- plaster of Paris
- petroleum jelly or cooking oil
- small paper cups (6 oz)
- objects such as leaves, dead insects, shells, or twigs, to make imprints
- water
- container to mix plaster
- paper towels
- toothpicks
- markers
- hand lens

TIME

45 minutes

Procedure

Check off each step as you do it.

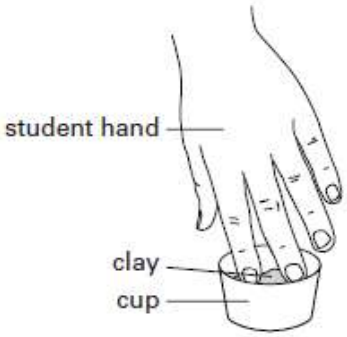
❑ ❶ Prepare two cups.

- Cut the top off of two paper cups. Leave about 3 cm from the bottom of the cup.

- Write your name on the bottoms of the cups.

❑ ❷ Insert clay into the cups.

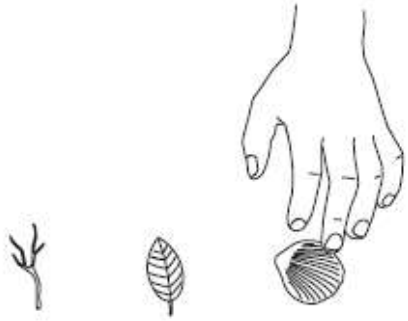
- Press a piece of clay into the bottom of the cup. There should be about 1 cm of space at the top of the clay.



- Use your fingers to smooth out the clay as much as possible.

❑ ❸ Choose objects to make fossils.

- Select 2 objects to use to make your model fossils.



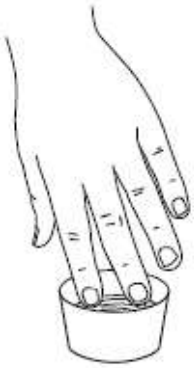
- Make sure the objects are small enough to fit into your cups.
- Use one object for each cup.

❑ ❹ Prepare the objects.

- Lightly coat the objects in petroleum jelly or cooking oil.

❑ ❺ Make an imprint.

- Carefully press the objects into the clay, and then remove the objects.



- If the image is unclear, you may smooth the clay and try again.

❑ ❻ Make the plaster of Paris.

- You need only a small amount for your cups.
- Your teacher may make enough for the whole class.

❑ ❼ Add the plaster of Paris.

- Pour the plaster into the paper cups, on top of the clay with impressed images.
- Your teacher may come around and pour the plaster for the whole class.

❑ ❽ Let the plaster set for 2–3 minutes until it is stiff enough to hold the shape of an object.

❑ ❾ Add objects to the plaster.

- Once the plaster is stiff, carefully press the object into the plaster.

- Let the plaster sit for a minute or two.

❑ ❿ Carefully remove the object.

❑ ⓫ Let all models sit undisturbed for at least 30 min.

❑ ⓬ Reveal fossils.

- When the plaster is dry, peel the paper cup from the plaster and clay.
- Carefully remove the clay from the plaster.

- Write your name on your model fossils.

Observe and Analyze

1. **Infer** Which of your model fossils represent cast fossils, and which represent molds? Draw a picture of each and label the model fossils *cast* or *mold*.

_____

_____

2. **Compare** Make two lists of observations—one for a model cast fossil and another for a model mold fossil. In what ways is a mold and a cast similar? In what ways do molds and casts differ?

_____

_____

3. **Explain** Draw a sketch of the model you made. What does each part represent? How many rock layers does your model have?

4. **Explain** How does the model you made differ from the way fossils actually form?

Conclude

1. **Apply** Examine one of your model mold fossils. If it was a real fossil, how might it have formed?

2. **Apply** Examine one of your model cast fossils. If it was a real fossil, how might it have formed?

3. **Infer** Suppose that you use clay to represent another rock layer on top of the plaster. What kind of fossil might form in the clay?

4. **Infer** Exchange fossils with one of your classmates. Try to find someone who you did not see make the model fossil, so you do not know what objects the person used. Imagine that you are a scientist who found these fossils. Make sketches and record detailed observations of the fossils. What can you tell about the object that the fossil represents? Return the fossil to your classmate when you are done.

Theory of Superposition

Examine the piece of jell-O your teacher has given you. Draw a picture of what you see. Either color it to resemble your piece of Jell-O, or label it correctly with appropriate colors.

Come up with a theory that describes how the Jell-O was made. Write it out below. You may use numbered steps, or paragraph form to do so.

Notes on Theory of Superposition:

Journey to the Center of the Earth Project

Part 1: Your teacher will give you a sheet of paper. On this paper, you are to draw **what you think the center of the earth looks like**. It's okay if you're just guessing, and it's also okay if you've already learned this from another class or grade in school. You may draw a cross-section diagram of the earth, you may just illustrate what you think it looks like below the surface of the earth. Your drawing should be colored, not just pencil and/or pen. There's no way to get this "wrong" unless you don't do it at all.

Label anything important and TITLE your drawing "What I Think"

Part 2: We will be watching the 1958 version of the movie *Journey to the Center of the Earth* based off the book by Jules Verne. This movie will take 2-3 days to watch in class. Your teacher will give you a sheet of paper. On this paper, you are to **draw the earth's surface and its various layers and the characters from the movie advance to the center of the earth. Your teacher will help point out each new layer,** and while you're watching you should also be working on your picture. Your drawing should be colored, not just pencil and/or pen. *You will be graded on this section based on the accuracy of your layers, and your effort and creativity put into your picture.*

Label anything important and TITLE your drawing "1958 Movie"

Part 3: We will be watching the 2005 version of the movie *Journey to the Center of the Earth* loosely based off the book by Jules Verne. This movie will take 2-3 days to watch in class. Your teacher will give you a sheet of paper. On this paper, you are to **draw the earth's surface and its various layers and the characters from the movie advance to the center of the earth.** Your teacher will help point out each new layer, and while you're watching you should also be working on your picture. Your drawing should be colored, not just pencil and/or pen. *You will be graded on this section based on the accuracy of your layers, and your effort and creativity put into your picture.*

Label anything important and TITLE your drawing "2005 Movie"

Part 4: Your teacher will give you a sheet of paper. Based off the information in your textbook and notes your teacher has given you, you are to **draw a picture that represents what is below the surface of the earth according to modern science**. Your drawing should be colored, and not just pencil and/or pen. In addition to your correct drawing, you should include 7 facts about the earth and its insides. These should be written neatly IN INK somewhere on your paper. *You will be graded on this section based on the accuracy of your layers, and your effort and creativity put into your picture, and your inclusion of 7 correct facts about the insides of the earth.*

Label anything important and TITLE your drawing "The Real Deal"

FINAL PROJECT: You will be given class time to glue your 4 drawings onto a 3-dimensional foldable. Your teacher will show you how to assemble this project. You will have one period to decorate your final project and glue your 4 drawings onto it. *Your final project will be graded on each of the 4 parts, and the overall neatness and creativity of the final product.*

Journey to the Center of the Earth Project Rubric

Part 1:	Title	_____(1)
	Labels/Explanations	_____ (1)
	Completed	_____ (1)
_____/4	Effort/Creativity	_____ (1)
Part 2:	Title	_____ (1)
	Labels/Explanations	_____ (1)
	Correct Layers	_____ (1)
_____/4	Effort/Creativity	_____ (1)
Part 3:	Title	_____ (1)
	Labels/Explanations	_____ (1)
……	Correct Layers	_____ (1)
_____/4	Effort/Creativity	_____ (1)
Part 4:	Title	_____ (1)
	Labels/7 Correct Facts	_____ (1)
	Correct Layers	_____ (1)
_____/4	Effort/Creativity	_____ (1)
Final Project	On Task in Class During Movies	_____ (1)
	All 4 Pages Present	_____ (1)
	Project Turned in On Time	_____ (1)
_____/4	Effort/Creativity	_____ (1)

D.4: Rocks and Minerals:

Minerals (ch. 14.1- 14.3)

Rocks and the Rock Cycle (ch.15.1-15.4)

Mechanical & Chemical Weathering (ch.16.1 & 17.1-17.4)

Earth's Layers and Plate Tectonics/Continental Drift (ch.18.1-18.2)

Plate Boundaries (ch.18.3-18.4)

Earthquakes & Volcanoes (ch. 19-1-19.2 & 20.1-20.2)

*It is the expectation of 8th grade science students to get missing notes or information from a friend, the website, or the corresponding sections of the textbook. Class notes will occasionally come from the textbook, however not all information used is from this resource. PowerPoints used in class are posted on the class website.

Rocks and Minerals Vocabulary Terms

Minerals

color
streak
luster
density
cleavage
fracture
hardness
moh's scale
crystal structure

Rocks and The Rock Cycle

Igneous rock
intrusive igneous rock
extrusive igneous rock
metamorphic rock
sedimentary rock
rock cycle
weathering
erosion
compaction/cementation
magma
lava
volcano
fossils

Mechanical & Chemical Weathering

Mechanical weathering
chemical weathering
erosion
weathering
acid rain
abrasion
mass wasting
sink hole
deposition

Earth's Layers & Plate Tectonics/Continental Drift

Crust
mantle
inner core
outer core
tectonic plates
continental drift
theory of plate tectonics
mid-ocean ridge
convection current
Pangaea
convection
rift valley
Ocean Trench
Wegener
spreading Center

Plate Boundaries

Convergent boundary
divergent boundary
transform boundary
continental plate
oceanic plate
subduction
collision

Earthquakes & Volcanoes

Normal fault
strike-slip fault
reverse fault
epicenter
focus
mountain belts
folded mountains
fault-block mountains

Project: Minerals Foldable

Directions: Using any foldable design of your choosing, design an informational foldable that contains the following 6 items about minerals. You will need to use chapter 14 in your textbook to find the information. Each section should be creative and include color and some sort of illustration or example.

Color and Streak (_____/3)
-define COLOR
-define STREAK
-what is the difference between COLOR and STREAK?

Luster (_____/3)
-define LUSTER
-what is NONMETALLIC LUSTER? Give an example
-what is METALLIC LUSTER? Give an example

Density (_____/3)
-define DENSITY (in terms of MINERALS)
-explain how to figure out or calculate the density of a mineral
-research at least 2 densities of common minerals

Cleavage and Fracture (_____/3)
-define CLEAVAGE
-define FRACTURE
-what is the difference between CLEAVAGE and FRACTURE? Use the terms ATOMS and BONDS/BONDING in your explanation.

Hardness (_____/3)
-define HARDNESS
-describe/explain MOH'S SCALE
-describe the process of determining HARDNESS

Other Special Properties (_____/3)
-list and give an example of any other identifiable mineral characteristics

Project Neatness/creativity Grade (_____/2)

Overall Grade: _____/26

4: 21-26 **3**: 15-20 **2**: 9-14 **1**: 3-8 **0**: 0-2

Mineral/Moh's Scale Lab

CHAPTER 14 | DATASHEET

Mineral Identification Key

In this table, minerals are arranged in order of increasing hardness. The most useful properties for identification are printed in *italic* type. The colors listed are the most common for each mineral.

Name	Hardness	Color	Streak	Cleavage	Remarks
Talc	*1*	Apple-green, gray, white	White	Perfect in one direction	Nonmetallic (pearly to greasy) luster. Nonelastic flakes, *greasy feel*. Sp. gr. 2.7 to 2.8.
Graphite	1–2	*Dark gray to black*	Grayish black	*Perfect in one direction*	Metallic or nonmetallic (earthy) luster. *Greasy feel, marks paper*. This is the "lead" in a pencil (mixed with clay). Sp. gr. 2.2.
Gypsum	*2*	Colorless, white, gray, yellowish, reddish	White	*Perfect in one direction*	Nonmetallic (glassy to silky) luster. *Can be scratched easily by a fingernail*. Sp. gr. 2.3.
Halite	2–2.5	Colorless, white	White	*Perfect, three directions, at 90° angles*	Nonmetallic (glassy) luster. *Salty taste*. Sp. gr. 2.2.
Muscovite mica	2–2.5	Colorless in thin films; silvery, yellowish, and greenish in thicker pieces	*White*	Perfect in one direction	Nonmetallic (glassy to pearly) luster. *Thin elastic films peel off readily*. Sp. gr. 2.8 to 2.9.
Galena	2.5	*Lead gray*	Lead gray	*Perfect, three directions, at 90° angles*	*Metallic luster*. Occurs as crystals and masses. *Dense*. Sp. gr. 7.4 to 7.6.
Biotite mica	2.5–3	Black, brown, dark green	White	*Perfect in one direction*	Nonmetallic (glassy) luster. *Thin elastic films peel off easily*. Sp. gr. 2.8 to 3.2.
Copper	2.5–3	*Copper red*	Copper	None	*Metallic luster on fresh surface. Dense*. Sp. gr. 8.9.
Calcite	*3*	White, colorless	White	*Perfect, three directions, not at 90° angles*	Nonmetallic (glassy to dull) luster. *Fizzes in dilute hydrochloric acid*. Sp. gr. 2.7.
Chalcopyrite	3.5–4	*Golden yellow*	Greenish black	Poor in one direction	Metallic luster. *Hardness distinguishes from pyrite*. Sp. gr. 4.1 to 4.3.
Dolomite	3.5–4	Pinkish, colorless, white	White	*Perfect, three directions, not at 90° angles*	Nonmetallic luster. *Scratched surface fizzes in dilute hydrochloric acid. Cleavage surfaces curved*. Sp. gr. 2.8 to 2.9.

Name	Hardness	Color	Streak	Cleavage	Remarks
Sphalerite	*3.5–4*	*Yellow, brown, black*	Yellow to light brown	*Perfect, six directions*	*Nonmetallic (brilliant to resinous) luster.* Sp. gr. 3.9 to 4.1.
Fluorite	4	Varies	White	*Perfect, four directions*	Nonmetallic (glassy) luster. In cubes or octahedrons as crystals. Sp. gr. 3.2.
Apatite	5	Green, brown	White	Poor in one direction	Nonmetallic (glassy) luster. Sp. gr. 3.1 to 3.2.
Augite	5–6	Dark green to black	Greenish	*Two directions nearly at 90°*	Nonmetallic (glassy) luster. *Stubby four- or eight-sided crystals.* Common type of pyroxene. Sp. gr. 3.2 to 3.4.
Hematite	5–6 (may appear softer)	*Reddish-brown, gray, black*	*Reddish*	None	Metallic or nonmetallic (earthy) luster. *Dense.* Sp. gr. 5.3.
Hornblende	5–6	*Dark green to black*	Brown to gray	*Perfect, two directions at angles of 56° and 124°*	Nonmetallic (glassy to silky) luster. Common type of amphibole. Long, slender, six-sided crystals. Sp. gr. 3.0 to 3.4.
Magnetite	5.5–6.5	*Black*	Black	None	Metallic luster. Occurs as eight-sided crystals and granular masses. *Magnetic. Dense.* Sp. gr. 5.2.
Feldspar (Orthoclase)	6	*Salmon pink, red,* white, light gray	White	*Good, two directions, 90° intersection*	Nonmetallic (glassy) luster. *Hardness, color, and cleavage taken together are diagnostic.* Sp. gr. 2.6.
Feldspar (Plagioclase)	6	*White to light gray,* can be salmon pink	White	*Good, two directions, about 90°*	Nonmetallic (glassy or pearly) luster. *If striations are visible, they are diagnostic.* Sp. gr. 2.6 to 2.8.
Pyrite	*6–6.5*	*Brass yellow*	Greenish black	None	Metallic luster. *Cubic crystals* and granular masses. *Dense.* Sp. gr. 5.0 to 5.1.
Olivine	6.5–7	*Yellowish, greenish*	White	None	*Nonmetallic (glassy) luster. Granular.* Sp. gr. 3.3 to 4.4.
Quartz	*7*	*Colorless, white; varies*	White	None	Nonmetallic (glassy) luster. *Conchoidal fracture. Six-sided crystals common.* Many varieties. Sp. gr. 2.6.
Topaz	*8*	Varies	White	Perfect in one direction	Nonmetallic (brilliant to glassy) luster. *Crystals commonly striated length-wise.* Sp. gr. 3.4 to 3.6.
Corundum	9	Brown, pink, blue	White	None, parting resembles cleavage	Nonmetallic (glassy to brilliant) luster. *Barrel-shaped, six-sided crystals with flat ends.* Sp. gr. 4.0.

Sp. gr. = specific gravity

Mohs Scale
1 Talc
2 Gypsum
3 Calcite
4 Fluorite
5 Apatite
6 Feldspar
7 Quartz
8 Topaz
9 Corundum
10 Diamond

CHAPTER 14 | CHAPTER INVESTIGATION A

Mineral Identification

MATERIALS

- numbered mineral samples
- hand lens
- streak plate
- copper penny
- steel file
- bar magnet
- dilute hydrochloric acid
- eyedropper
- Mohs scale
- Mineral Identification Key

PURPOSE

In this lab you will

- observe minerals
- test minerals
- identify minerals based on the results of your tests

Procedure

❑ ❶ Take a mineral sample from the mineral set. Each mineral has a number on it.

❑ ❷ Find your mineral's color.

- Look at the color of your mineral.
- Write its color in Table 1 in the *color* row.

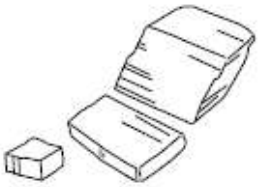
TABLE 1: MINERAL PROPERTIES

Property	Sample Number				
	1	2	3	4	5
Color					
Luster					
Cleavage					
Fracture					
Streak					
Hardness					
Special Tests					
Magnetic					
Acid Test					
Name of Mineral					

❑ ❸ Determine your mineral's luster. The luster of a mineral refers to how light reflects from it. A mineral that looks as if it is made of metal has a metallic luster. All other minerals have nonmetallic lusters.

- Observe how your mineral reflects light.
- Write its luster in Table 1 in the *luster* row.

❑ ❹ How does your mineral break? Does your mineral break along flat surfaces?



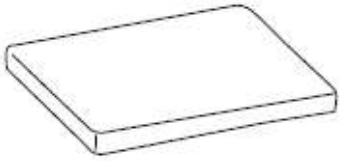
Cleavage

Fracture

a. Look at the broken surfaces of your mineral with a hand lens. If the crystals are broken along flat or somewhat flat surfaces, it has cleavage. Write *yes* in the *cleavage* row. Otherwise, write *no* in that row.

b. Look at the broken surfaces of your mineral with a hand lens. If the mineral's crystals are not broken along flat or somewhat flat surfaces, the mineral fractures. Write *yes* in the *fracture* row. Otherwise, write *no* in that row.

❑ ❺ Find your mineral's streak. The streak of a mineral is the color of the line it leaves when you rub it across a streak plate.

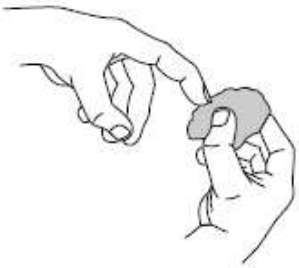


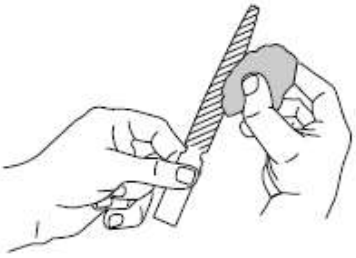
a. Rub the mineral across the streak plate. Keep the streak plate on your desktop or table while you are working with it. A broken streak plate can cause serious cuts.

b. Look at the streak plate. If the sample does not leave a line, write *no* in the *streak* row of Table 1.

c. If the sample leaves a line, write the color of the line in the *streak* row of Table 1.

❑ ❻ Find your mineral's hardness.





a. Try to scratch your mineral with your fingernail. If your fingernail scratches the mineral, find the hardness number of a fingernail on the hardness scale. In Table 1, write that the mineral's hardness is less than that number. Then go to step 7. If your fingernail does not scratch the mineral, go to step b.

b. Scratch a copper penny with your mineral. If the mineral does not scratch the penny, find the penny's hardness number on the scale. In Table 1, write that the mineral's hardness is less than that number. Then go to step 7. If the mineral does not scratch the penny, go to step c.

c. Scratch a steel file with your mineral. If the mineral does not scratch the file, find the hardness number of the steel file on the scale. In Table 1, write that the mineral's hardness is less than that number. Then go to step 7.

Mohs Hardness Scale		
Talc	1	Scratched by a fingernail
Gypsum	2	
Calcite	3	Scratched by a copper coin
Fluorite	4	Scratched by a steel file
Apatite	5	
Feldspar	6	Scratched by a steel file
Quartz	7	
Topaz	8	
Corundum	9	
Diamond	10	Scratches all other minerals

❑ ❼ Find out if your mineral is magnetic.

- Put the bar magnet next to the mineral.
- If the magnet moves toward the mineral, write *yes* in the *magnetic* row in Table 1. If the magnet does not move, write *no*.

❑ ❽ Repeat steps 1–7 with four other mineral samples.

Observe and Analyze

1. **Interpret Data** Identify each of your mineral samples.

   a. Get the mineral identification key from your teacher.

   b. Compare the properties of each mineral you tested with the minerals on the key.

   c. Find the mineral on the key that matches each of your mineral samples most closely. Write the name of each mineral in Table 1.

2. **CAUTION: Acids can burn you. Put on your safety glasses, gloves, and lab apron before you do the acid test.**
   Do you think that one of your samples is calcite? Calcite is part of the carbonate family of minerals. They bubble when you drop acid on them. Do this test to make sure you correctly identified the mineral as a carbonate.

   a. With an eyedropper, put a few drops of acid on the mineral you identified as calcite.

   b. If the sample bubbles, it is a carbonate.

Conclude

1. **Compare and Contrast** How are calcite and halite alike?

   _____

   _____

   What test can you use to tell calcite from halite? Hint: Halite is not part of the carbonate family of minerals.

   _____

   _____

2. **Interpret** Look at the results on the data table. Name any minerals that you could identify with just one property.

   _____

   _____

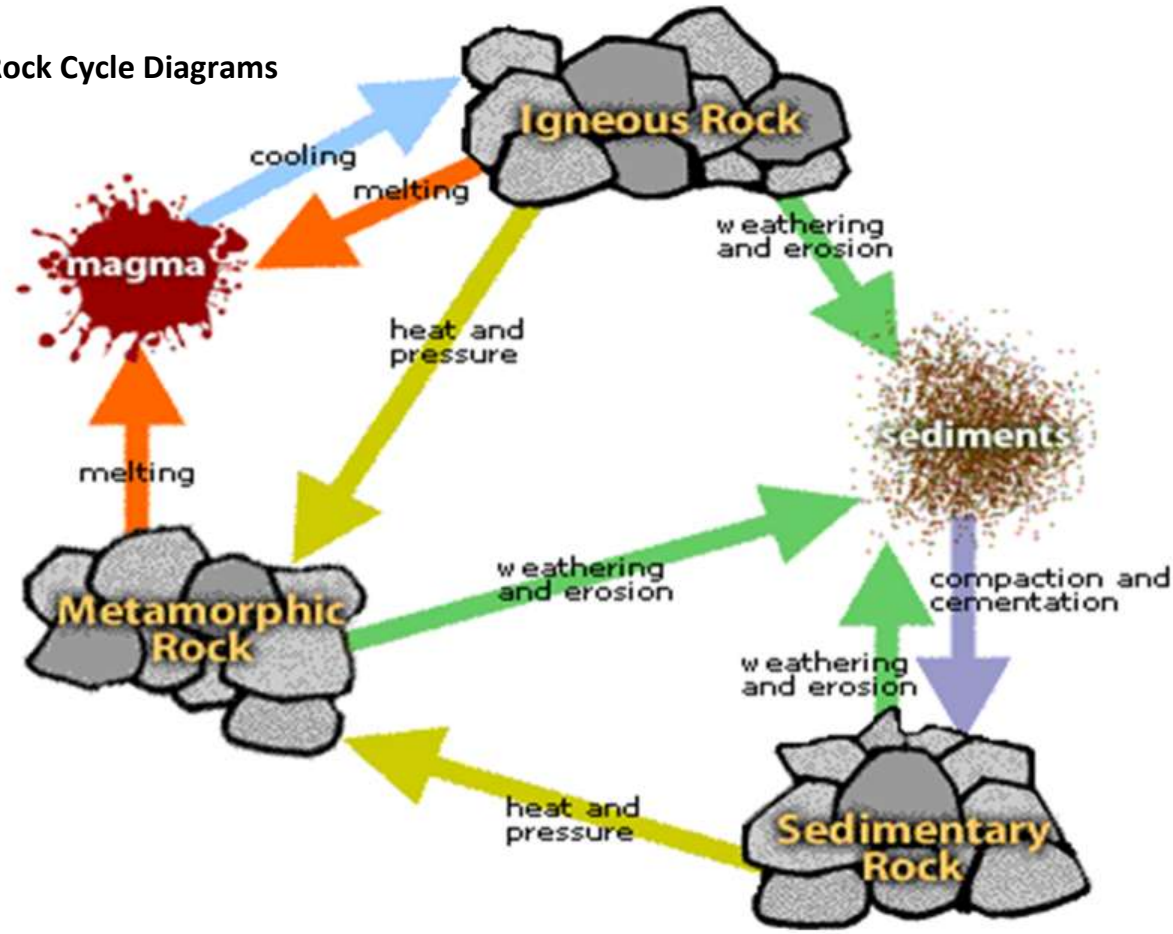
3. **Apply** Look at a piece of granite rock. You can see that granite contains more than one mineral. Use what you have learned in this lab to identify some of the minerals in granite.

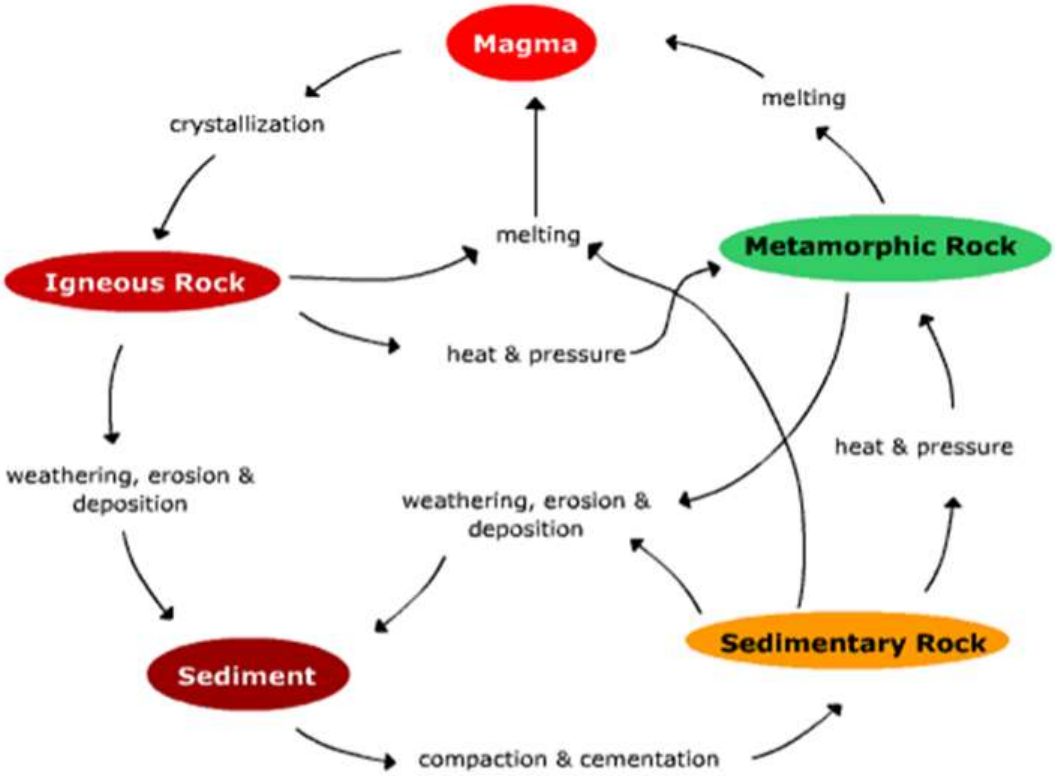
   First, identify the light-colored mineral that looks as if you can see partway into it.

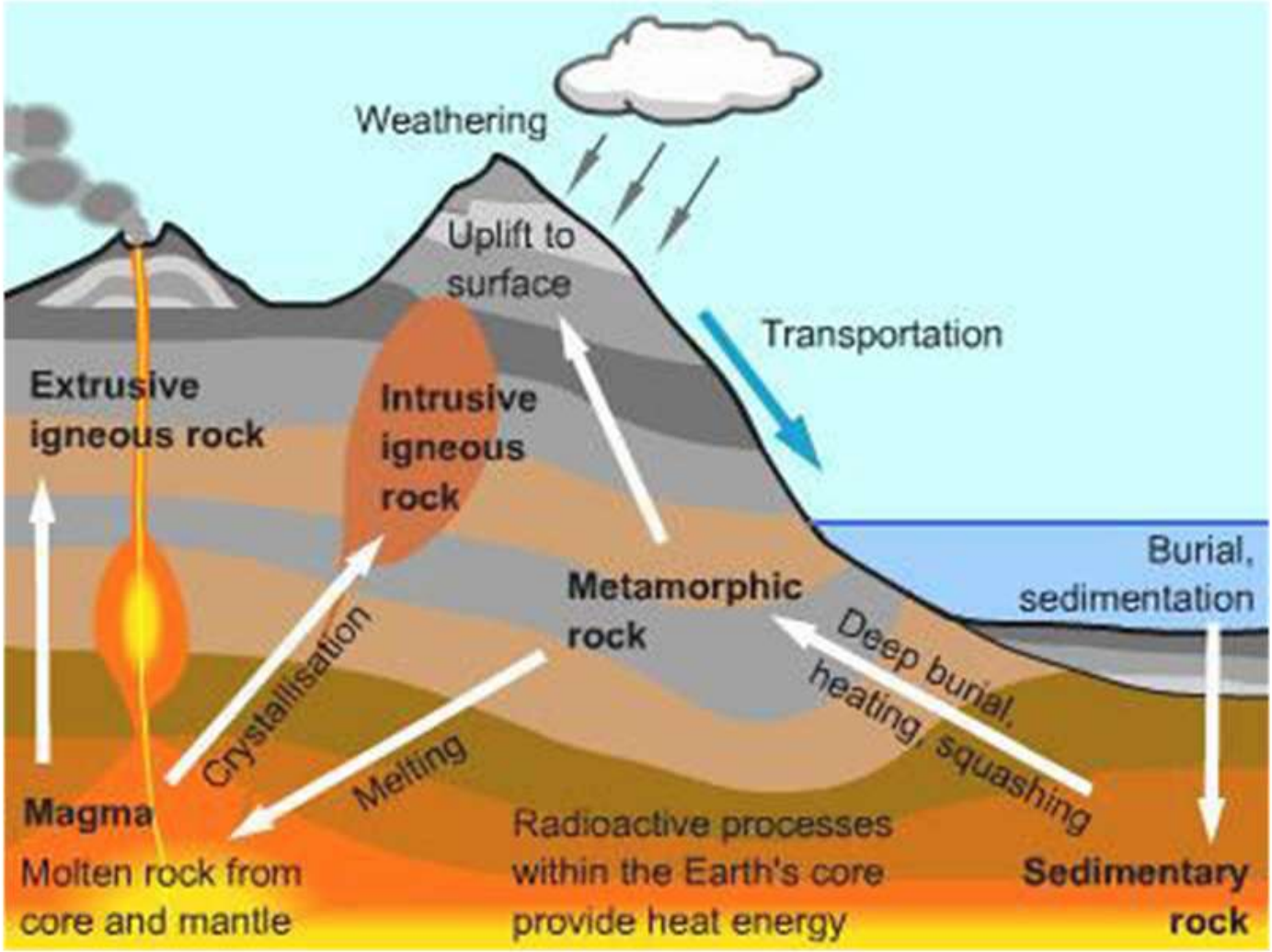
   _____

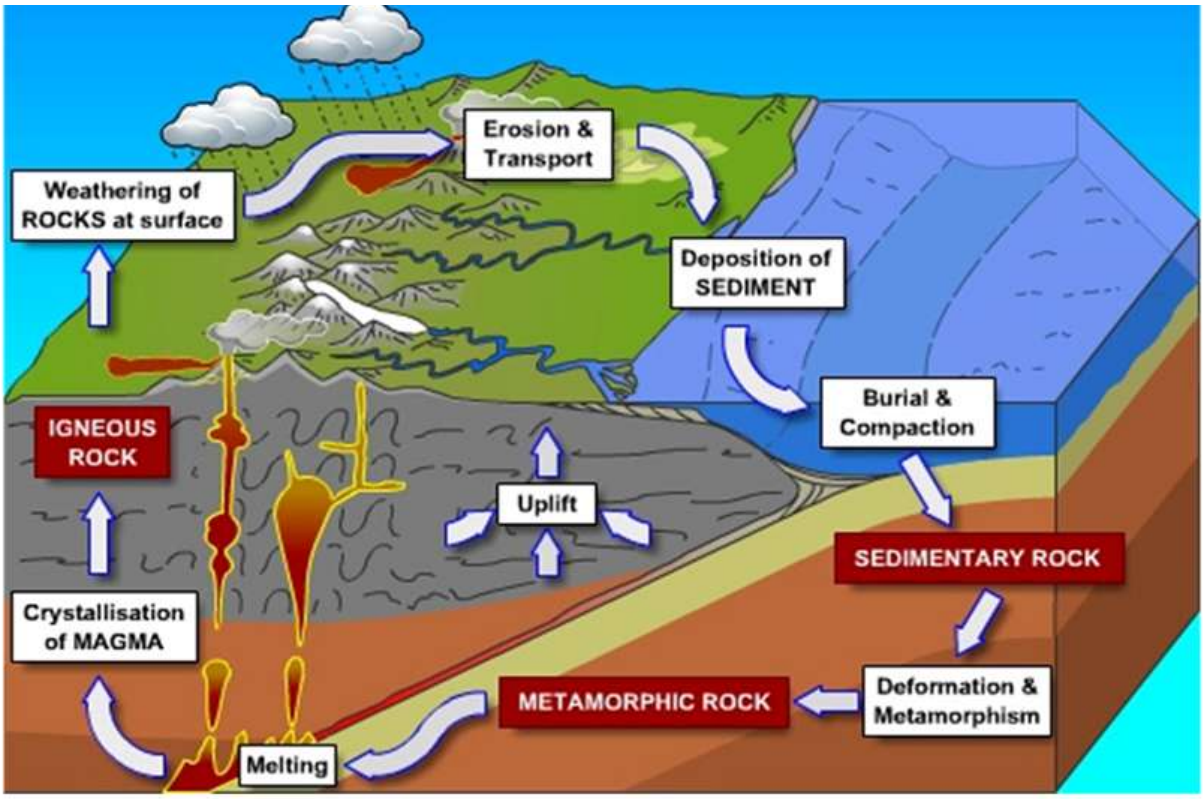
   Then identify the flaky, darker mineral. _____

Rock Cycle Diagrams






Weathering
Uplift to surface
Transportation
Extrusive igneous rock
Intrusive igneous rock
Metamorphic rock
Burial, sedimentation
Crystallisation
Deep burial, heating, squashing
Melting
Magma
Molten rock from core and mantle
Radioactive processes within the Earth's core provide heat energy
Sedimentary rock


Erosion & Transport
Weathering of ROCKS at surface
Deposition of SEDIMENT
Burial & Compaction
IGNEOUS ROCK
Uplift
SEDIMENTARY ROCK
Crystallisation of MAGMA
Deformation & Metamorphism
METAMORPHIC ROCK
Melting

Journey on the Rock Cycle

Journey on the Rock Cycle Name _____

This sheet is to help you write about your experiences as a rock during your journey on the rock cycle. You will need to describe your adventures at each spot and tell about what kind of rock you feel that you were.

(1) I began my adventure at _____.

(2) The first thing that happened was _____,
then I went to _____.

(3) The next thing that happened was
_____,
then I went to _____.

(4) The next thing that happened was
_____,
then I went to _____.

(5) The next thing that happened was
_____,
then I went to _____.

(6) The next thing that happened was
_____,
then I went to _____.

(7) The next thing that happened was
_____,
then I went to _____.

(8) The next thing that happened was
_____,
then I went to _____.

(9) The next thing that happened was
_____,
then I went to _____.

(2) The next thing that happened was
_____,
then I went to _____.

(10) The next thing that happened was
_____,
then I went to _____.

(11) The next thing that happened was
_____,
then I went to _____.

Simply Sediments

Name _____

Part 1: Create a sediment bottle!

1. Use a plastic bottle (1 liter or smaller) and sediments from your community to create a sediment bottle. Don't fill the bottle more than halfway full with sediments. What types of sediments did you find?

2. Add water to fill up the bottle to within one inch of the cap. Screw on the cap tightly! Use a permanent marker to write your name on the cap.

3. Shake and observe! Describe your observations in the space below.

Part 2: Experiment!

4. After your sediment bottle has been allowed to stand undisturbed overnight, what do you observe?

(a) Draw and label what you see on the diagram of the sediment bottle.

(b) Describe your observations.

(c) Predict what will happen after your sediment bottle is allowed to sit undisturbed for one week.

5. Which types of sediments float? Which ones move along the bottom?

6. If you were to continue moving the bottle for a long time, what would happen to the large sediments?

7. Would you find fossils in sedimentary rocks? Why or why not?

The Rock Cycle

How do rocks form? Are new rocks forming at this moment? Why do they break up into small pieces? Why are there layers and streaks? After this lab and the culmination of Unit 4 you should know the answers to all of these questions.

Materials:

wax paper
plastic knife
crayons
newspaper
Al foil
tuna can
hot plate
snow or ice cubes

PART 1 WEATHERING

1. Cover your lab table with newspaper like a table cloth.
2. Obtain two squares of wax paper, a plastic knife, and four crayons the same color as your lab partners.

The crayons are your parent rock material and the pencil sharpener is your disintegration weathering agent.

Shave each crayon color into a small pile with your partner's on the waxed paper. ***Keep each color separate.***

• Are all your "rock fragments" the same size? Why or why not?

• What are some of nature's weathering forces?

PART 2 EROSION and SEDIMENTATION

3. Obtain a piece of Al foil 45 cm x 45 cm. Fold it in half (22.5 cm x 45 cm). You are now the erosion force.

Carefully "erode" (move) one color of your "rock fragments" and put them in the center of the foil making an 8 cm x 8 cm layer of "sediment."

Now the other partner should add a second color of "rock fragments" to the "sediment."

Continue adding the other "rock fragments" to the "sediment."

4. When finished fold each side of the foil over the "rock fragments." Allow for a 1 cm distance between the shavings and each fold as room for expansion.

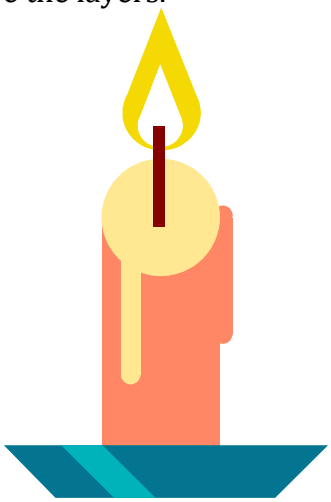
PART 3 COMPACTION, CEMENTATION and LITHIFICATION

5. Place your "rock fragment" sandwich on the floor.
Mildly compress your package by carefully applying pressure with your foot.
Carefully open your package.

6. Break the compressed central region, look at the broken edges and describe the layers.

• How do they compare to the original layers?

• What happened to the spaces between the fragments?



PART 4 METAMORPHISM

7. Replace the fragments and rewrap your package.
Your rocks are now going to be buried deep within the earth or be subjected to mountain building when you add as much pressure as you can by standing with one foot on your package and applying all of your body weight to it. You may even carefully stomp on it.

8. Remove your newly formed "metamorphic rock." Open the foil and break your rocks open. Examine them carefully, noting what happened to the thickness, fragment shape and the texture of the surface against the foil.

PART 5 IGNEOUS ROCK FORMATION and VOLCANIC ACTIVITY

9. Obtain a clean tuna can and place your "metamorphic rocks" in the can.
Carefully heat to melting over a hot plate. If it starts to smoke, you are heating it too strongly.

10. While it is heating obtain a beaker full of snow from outside or make a bowl-shape with another piece of Al foil with 5-6 ice cubes in it.

11. When your "magma" has formed "erupt your volcano so lava flows" (carefully pour it) over the snow or ice cubes. After it has cooled remove your "extrusive igneous rocks."

• Do you see any crystals?

• What kind of texture and shape do you see?

12. Clean up your lab area and return equipment to the supply table.

Chapter 17–20 Jigsaw Project

1) Group Members: _____

2) Write your science objective (main topic).

_____

_____

_____

3) Meet with your partner and compare notes from your reading. If you do not have the same basic notes, then discuss and add them so that your notes are similar.

4) Read your required reading questions and compare/contrast your answers with your partners. Come to an agreement on your final answers to the questions. You will be responsible for sharing this information with your classmates so be sure your answers are thorough and accurate.

5) You will be making a PowerPoint presentation to teach the material from your designated section. Your presentation MUST include pictures, vocabulary words, and answer your key questions. It should also include some additional interesting information.

6) Start planning your presentation! You may use the back of this paper.

7) Grading:

You will be graded daily on individual behavior and participation.

You will be graded on your presentation to the class of your project.

You will be graded on your project containing CORRECT answers to ALL of the key questions to which you were assigned and on the quality of the PowerPoint itself.

You will be graded on the inclusion of bibliographical resources and pictures

NOTES on GRADING:

PROJECT DUE DATE: _____ printed powerpoints due!

1) rubric for PRESENTATION GRADE (LIFE SKILLS—Averaged for Grade)

Verbal Presentation:

Volume/Projection (did the presenter speak loudly enough to be heard?)	Very Bad 1	2	3	Very Good 4
Enunciation/Clarity (could you understand the presenter?)	Very Bad 1	2	3	Very Good 4
Appropriateness (did the presenter avoid phrases like "umm," "like," or "and . .you know"?)	Very Bad 1	2	3	Very Good 4
Project Explanation (did the presenter describe the project objectives and outcomes to the class?)	Very Bad 1	2	3	Very Good 4

Visual Presentation:

Professionalism (was the presenter dressed nicely and not chewing gum?)	Very Bad 1	2	3	Very Good 4
Project Visual (was the visual eye-catching and engaging?**)**	Very Bad 1	2	3	Very Good 4
Neatness (was the visual neatly done, did it show effort?)	Very Bad 1	2	3	Very Good 4

2) POWERPOINT GRADE (HOMEWORK GRADE—No "re-do's" allowed for project grade)

Includes pictures _____(1)

Answers questions correctly _____(1)

Includes sources (exact webpages or book/author/page #) _____(1)

Neatness/aesthetic appeal (not too busy or obnoxious) _____ (1)

3) LIFE SKILLS GRADE (2 separate grades)

Turned in printed power point ON TIME **4 3 2 1 0**

Used time effectively in computer lab **4 3 2 1 0**

It is important that you realize that YOU are the teacher and your classmates are counting on YOUR presentation to help prepare them with notes for their quiz. If you are NOT in school the day you are scheduled (in advance) to present, the quiz will NOT be postponed. Your classmates are counting on your professionalism and presence to be prepared for their quizzes. If you are SICK, you or your parents need to e-mail Mrs. A or Mrs. B to let them know so your project can be presented to the class in your absence. You will forfeit your Presentation Life Skills grade, unless you arrange an appointment within 5 days of your scheduled presentation date before school to present to a small group of teachers and students who have graciously volunteered to provide you an audience.

Groups Numbers and Topics (and sections of the textbook topics are located):

Group Number/Topic
1: Explain different types of mechanical and chemical weathering and what types of changes they make to rocks. 16.1
2: Define the natural forces of erosion and deposition and explain how they shape the Earth's surface. 17.1
3: Identify types of moving water and how they shape the Earth's surface. 17.2 Describe how waves and wind shape the Earth's surface. 17.3
4: Define Glacier; and describe how its movement effects the shape of the Earth's surface. 17.4
5: Name the different layers of the Earth tell about their properties. 18.1
6: Describe the theory of Continental Drift, and evidence/causes of plate movement. 18.2
7: Identify and explain the three plate boundaries and explain what results with each one. 18.3
8: Explain what happens when plates converge (types of subduction) or scrape past each other. 18.4
9: Discuss the three types of faults and the types of stress that produces them. Also discuss how energy from earthquakes travels through the earth. 19.1-19.2
10: Discuss how the movement of rock builds mountains; and sometimes volcanoes. 20.1-20.2

Chapter 17-20 Jigsaw Project KEY QUESTIONS

Fill out the answers to each of these questions while you listen to other groups present. If you do not hear or understand some of the answers to the questions you can access these questions in your McDougal Science Textbook. You will have the opportunity to use these questions and answers on our exam at the end of the presentations. **Each group is responsible for presenting their listed questions and answers to these questions in their project and during their presentation.**

Group 1 (16.1 p.543-548)

1. What is Weathering?

2. What are FOUR causes of mechanical weathering? (with details)

3. How do water and air help cause CHEMICAL weathering?

4. Describe THREE factors that affect the rate at which weathering occurs.

Group 2 (17.1 p.573-577)

5. How does erosion change landscapes?

6. How is WEATHERING different from EROSION?

7. Describe why weathering is important in erosion.

8. How can gravity move large amounts of rock and soil?

Group 3 (17.2 p.578-583)

9. What is the difference between a drainage basin and a divide?

10. How do streams change as they flow from mountains down to plains?

11. How do caverns form?

12. What kinds of landforms do longshore drift and longshore currents produce?

13. How do dunes form?

14. How does loess form, and why is it important?

Group 4 (17.4 p.593-598)

15. Describe the TWO processes that cause glaciers to move.

16. What are the TWO major types of glaciers? Where are they found?

17. Describe the land features left behind by glaciers that have melted and shrunk.

Group 5 (18.1 p.613-617)

18. Briefly describe the inner and outer cores, the mantle, and the crust.

19. In what ways is the lithosphere different from the athenosphere?

20. Describe the structure of most tectonic plates.

Group 6 (18.2 p.618-623)

21. What evidence did Wegener gather to support his continental drift hypothesis?

22. Give THREE types of evidence from the sea floor that prove Earth's tectonic plates move.

23. Explain how motions in the athenosphere can move tectonic plates around earth.

Group 7 (18.3 p.626-632)

24. Name and describe the THREE types of plate movements. (Illustrate if necessary)

25. Fill in the chart for divergent boundaries at sea and on land.

DIVERGENT BOUNDARY (illustration)	WHAT RESULTS?
Sea	
Land	

26. How are hot spots used to track plate motion?

Group 8 (18.4 p.634-640)

27. What are the THREE types of convergent boundaries? Illustrate and explain them.

28. Describe what happens at a TRANSFORM BOUNDARY.

29. Why is the theory of plate tectonics so important to geologists?

Group 9 (19.1-19.2 p.649-663)

30. What causes earthquakes?

31. Why do most earthquakes occur along tectonic plate boundaries?

32. What is the main direction of stress on blocks of rock at normal faults, reverse faults, and strike-slip faults?

33. Why does the greatest shaking of the ground occur near an earthquake's epicenter?

34. What information doyou need to completely describe where an earthquake started?

Group 10 (20.1-20.2 p.681-697)

35. How is the formation of mountain belts related to tectonic plate boundaries?

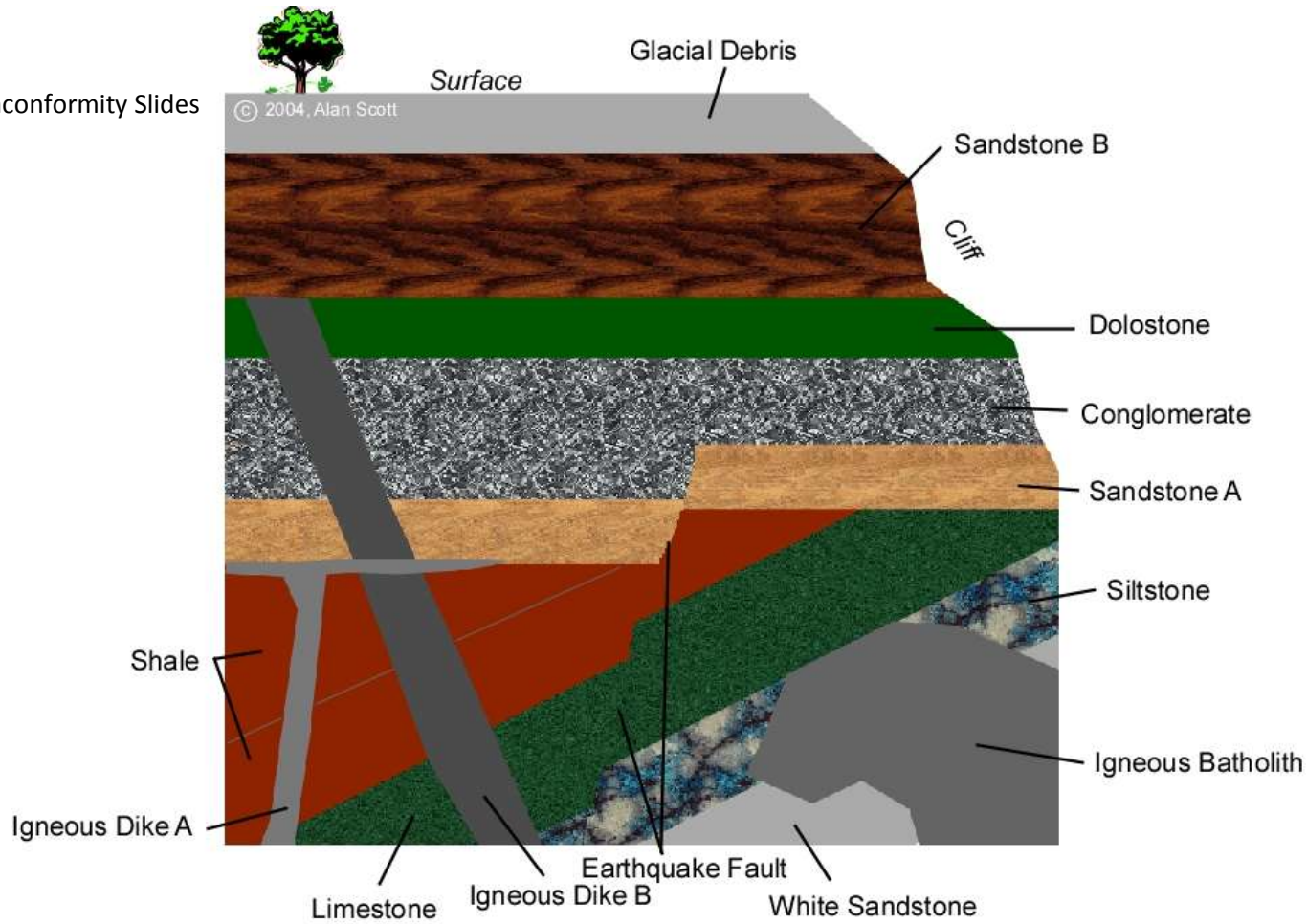
36. How do FOLDED mountains form?

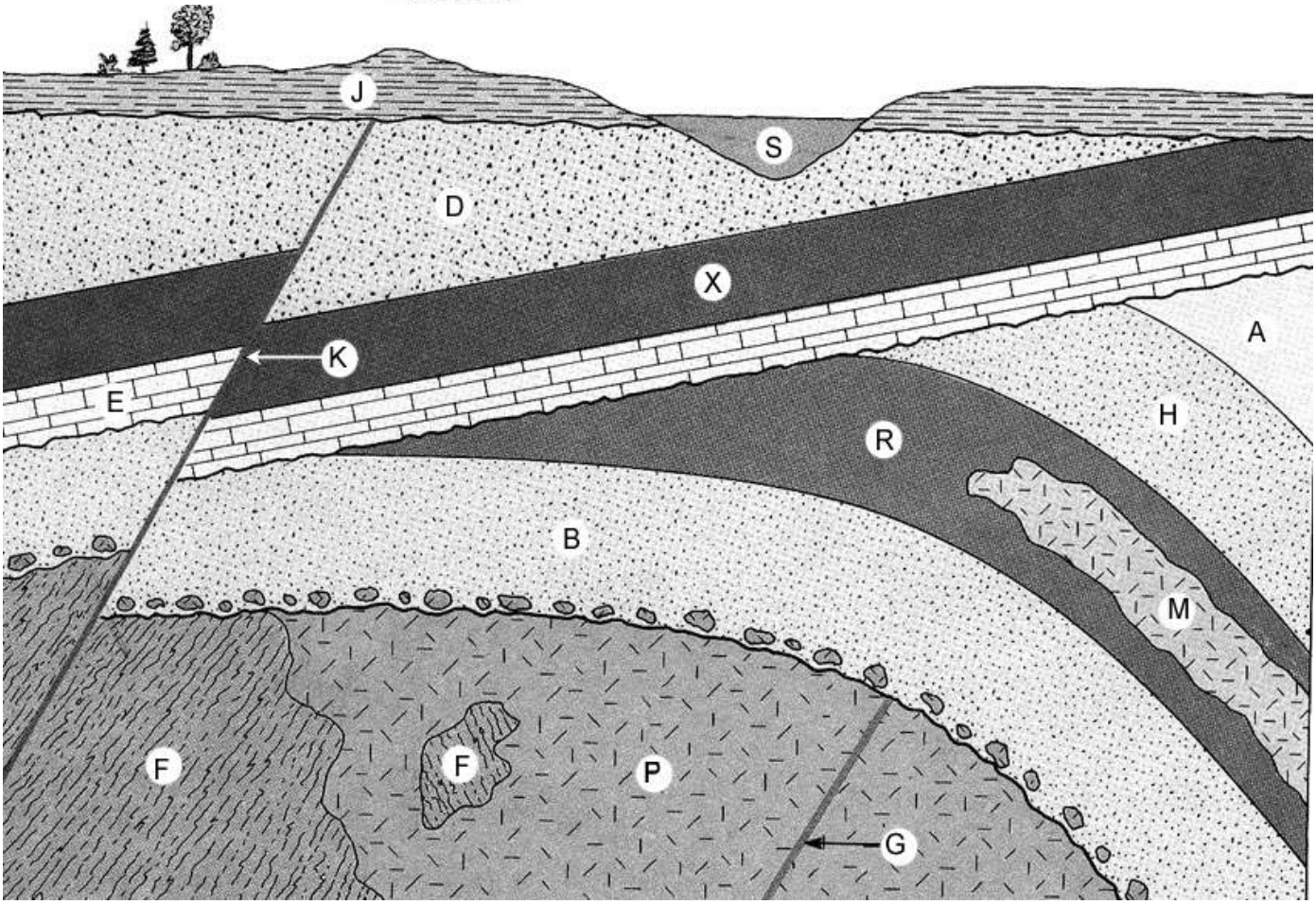
38. How do FAULT-BLOCK mountains form?

39. Where are most volcanoes located, and why are they located there?

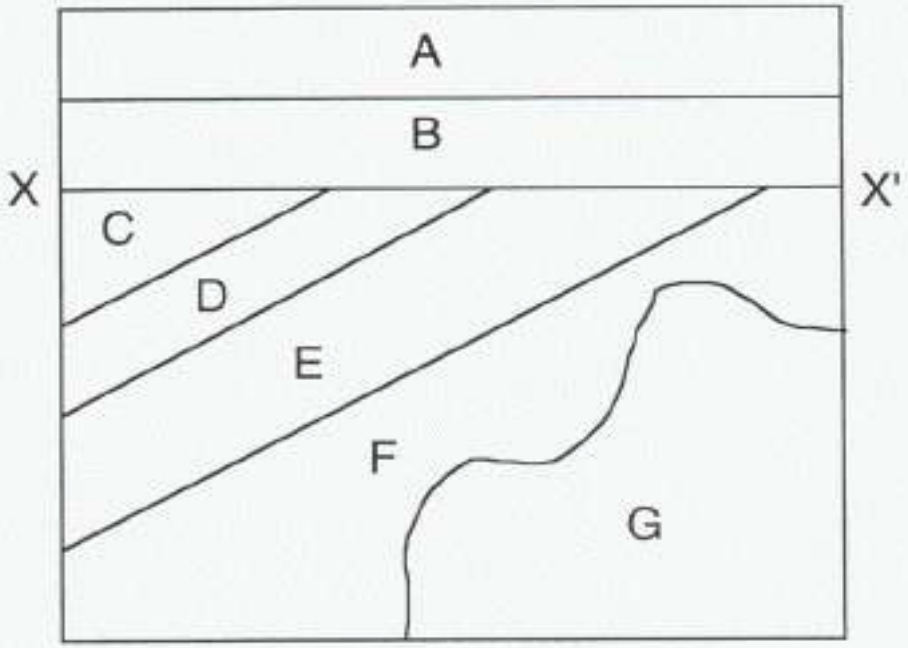
40. How does the TYPE OF MATERIAL that erupts from a volcano determine the SHAPE of the volcano?

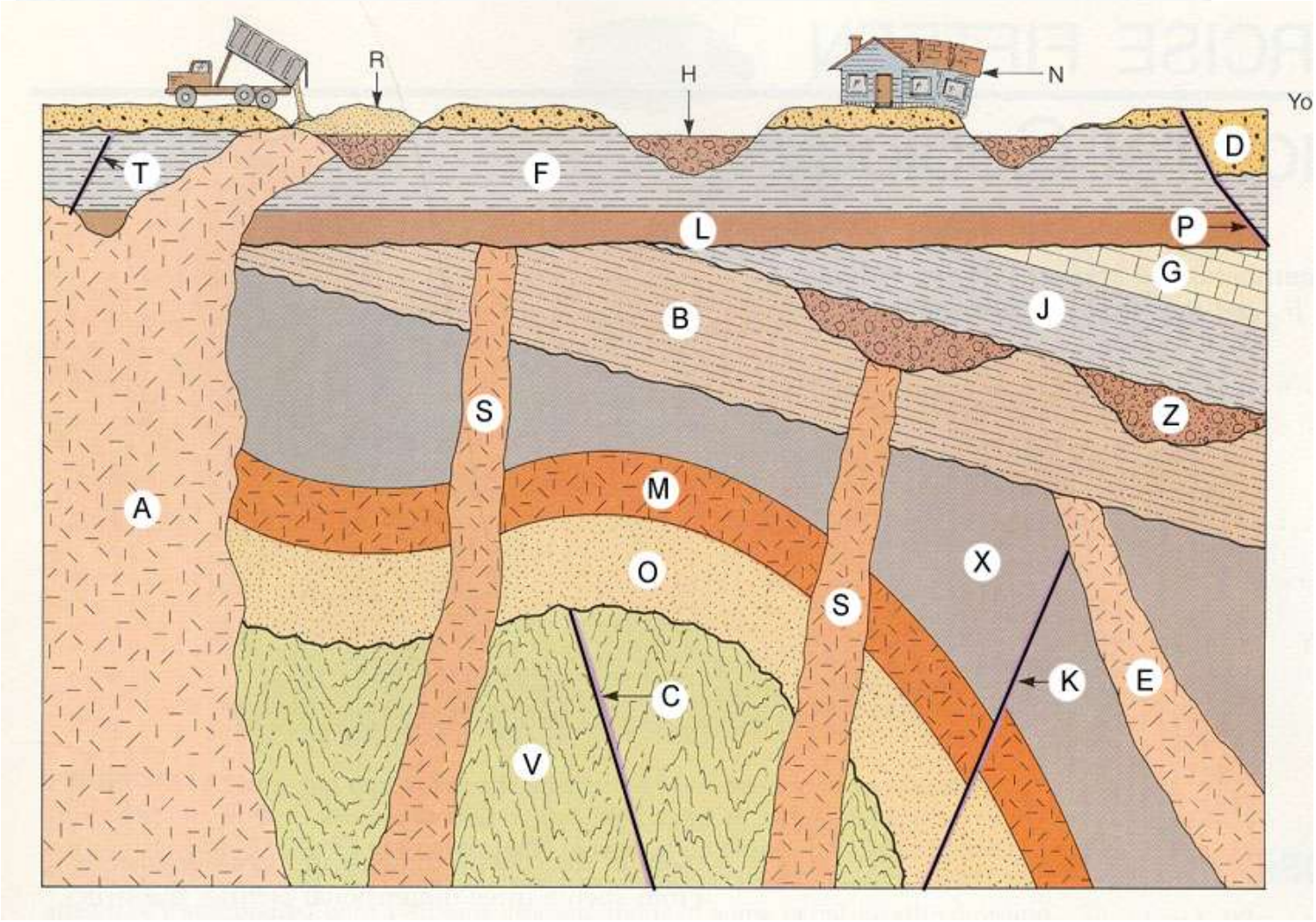
Unconformity Slides

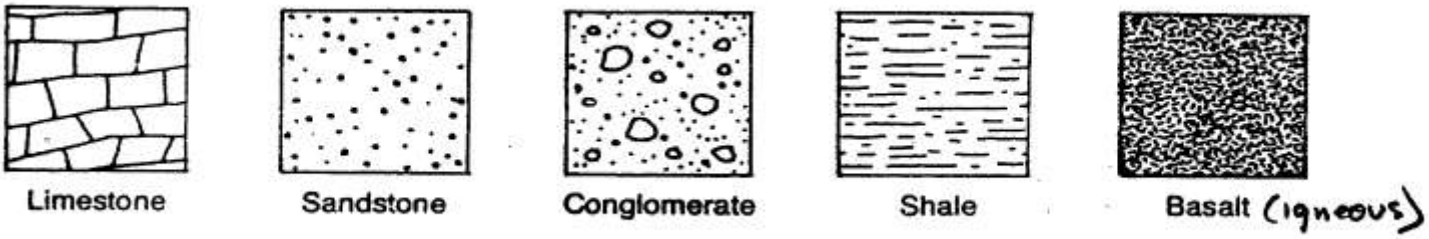


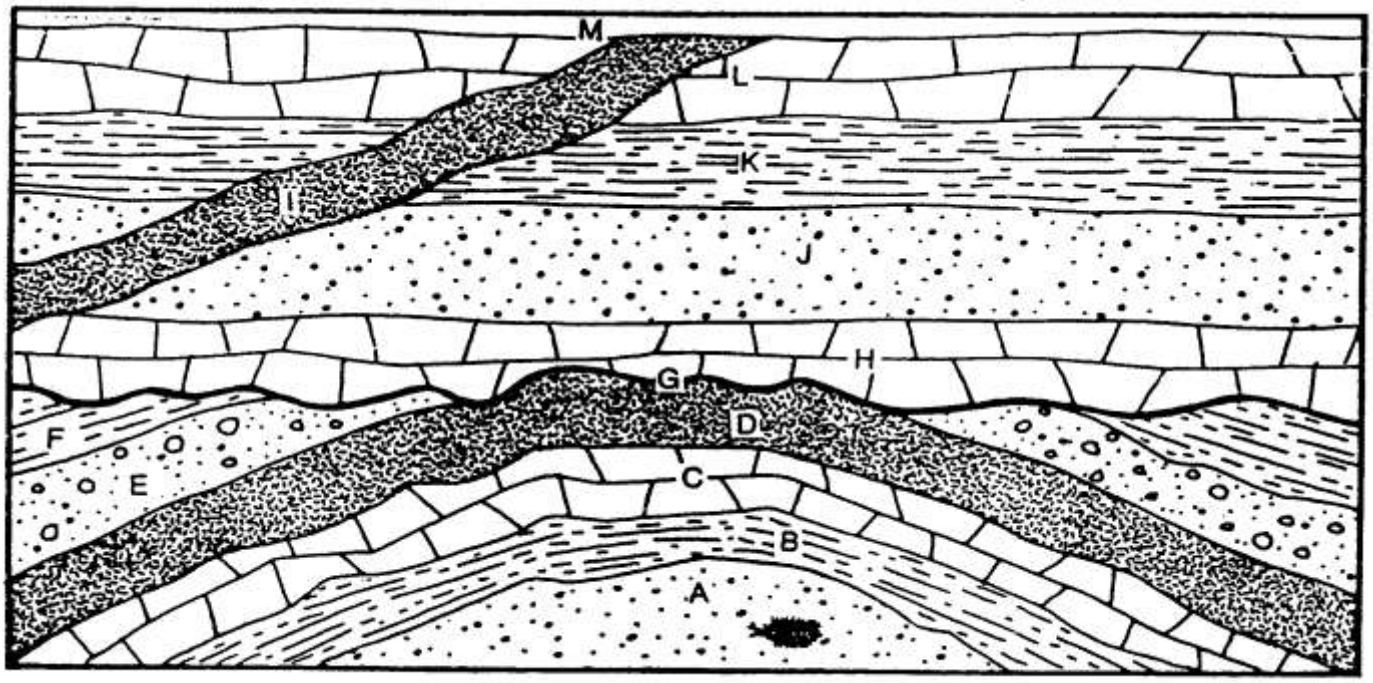


In the following geologic cross section, units A, B, C, D, E, and F are sedimentary rocks. Unit G is a granite.






Limestone
Sandstone
Conglomerate
Shale
Basalt (igneous)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