

# **GRADE 7 SCIENCE**

## **UNIT 4: THE EARTH'S CRUST**

### **Rocks and Minerals**

# MINERAL

○ A pure, naturally occurring inorganic solid.

There are hundreds of different minerals on our planet – many look alike.

# PROPERTIES OF MINERALS

## **Color**

“ What color is the mineral?”

\* Alone, color is NOT a  
reliable way to identify a mineral.

**WHY?**

Gold has a golden color.

Which mineral is gold?



Gold



Pyrite

# PROPERTIES OF MINERALS

## Lustre

“How shiny is the mineral?”

OR

How the light is reflected from the mineral's surface

# TERMS DESCRIBING LUSTRE...

**Dull:** does not reflect light

Example: Chalk



# TERMS DESCRIBING LUSTRE...

**Metallic:** looks like metal

Example: Silver



## TERMS DESCRIBING LUSTRE...

**Glassy:** Has a surface reflection like a piece of glass

Example: [Calcite](#)





# PROPERTIES OF MINERALS

## Streak

- The powdered form of the mineral.

“What color is left behind when you scratch a porcelain tile?”

Example:

Hematite: comes in many colors  
but has a reddish streak always



# PROPERTIES OF MINERALS

## **Hardness**

- “How difficult is it to scratch a mineral?”

The harder mineral will scratch the softer one. \*Use Mohs Hardness Scale

How can we use this scale?

## Mohs Scale of Hardness

Mineral	Scale Number	Common Objects
Talc	1	
Gypsum	2	
Calcite	3	Fingernail Copper Penny
Fluorite	4	
Apatite	5	Steel Nail Glass Plate
Orthoclase	6	
Quartz	7	
Topaz	8	Streak Plate
Corundum	9	
Diamond	10	

*Refer to page 210 in text*

## Using Moh's Hardness scale

If you scrape topaz and apatite together, which will scratch the other? \_\_\_\_\_

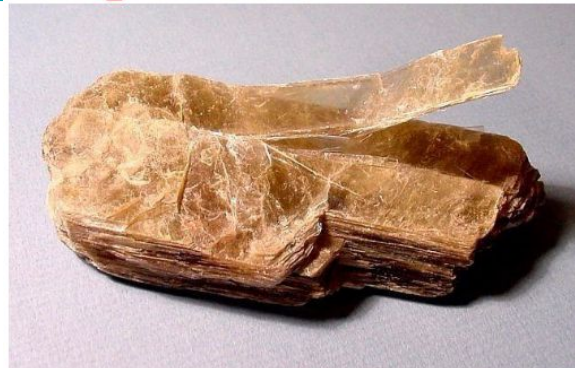
If you rub talc and gypsum, which will scratch the other?  
\_\_\_\_\_

How would you tell the difference between calcite or quartz using the Moh's Hardness Scale?  
\_\_\_\_\_

# PROPERTIES OF MINERALS

## Cleavage

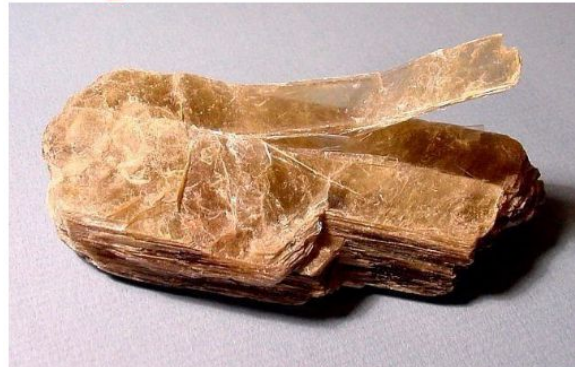
- The tendency to split along smooth, flat surfaces called planes.



# PROPERTIES OF MINERALS

## Cleavage

- Example: Mica cleavs along one plane (in sheets)



Do All Minerals have cleavage?





Do All Minerals have cleavage?

NO!



# PROPERTIES OF MINERALS

## Fracture

- Breaking with rough or jagged edges.



# PROPERTIES OF MINERALS

## Fracture

- Example: Quartz does not break along any plane



Other properties scientists may sometimes use:

a. Crystal structure

b. Heft – how heavy it feels.

c. Odor

d. Magnetism

e. Whether the surface feels powdery, soapy or greasy.

Core Lab Activity 10-1C Pages

322(3)

*“A Mineralogist’s Mystery”*

# Classification of Rocks

## Discussion Questions

1. How do the crystals or minerals form in a rock?
2. Why do some rocks have layers?
3. Why do some rocks have rounded particles while others have angular particles?

Rocks:

Are ► combinations of two or  
more minerals.



# Rocks

They can be grouped into three families depending on how they are formed.

- Igneous
- Sedimentary
- Metamorphic

# 1. Igneous Rocks

Result from the cooling of molten (melted) rock material.

- ▶ The cooling creates crystals in the rocks.
- ▶ Basalt and granite are the most common.

## 2 Types of molten material

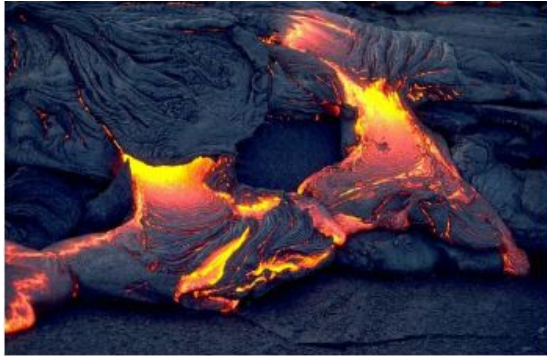
Lava: Molten material that is on the surface of the earth

Magma: Molten material that is inside the earth

2 Types of molten material

Above the

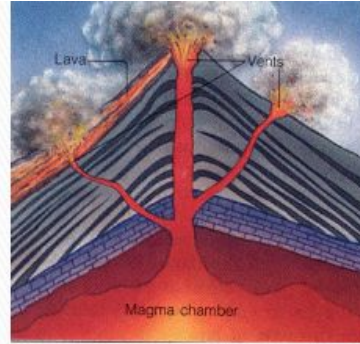
Ground



Lava

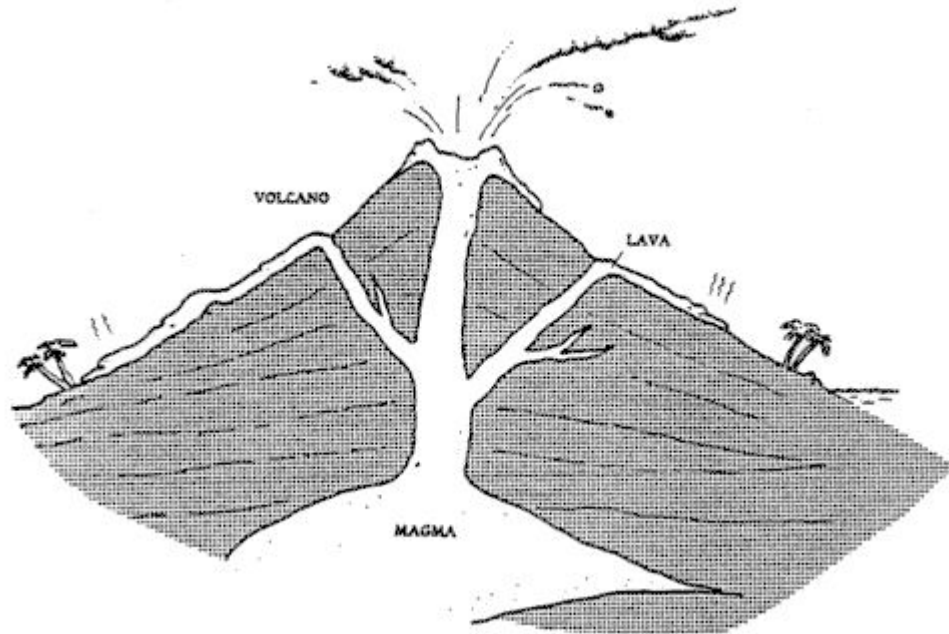
Below

the ground



Magma

Draw a diagram to show the difference between magma and lava.



## 2 Types of Igneous Rocks

1. Intrusive
2. Extrusive

## 2 Types of Igneous Rocks

# Intrusive

- ▶ formed below the surface of the Earth.
- ▶ Rocks cool very slowly.
- ▶ They have large crystals.



Gabbro



Granite



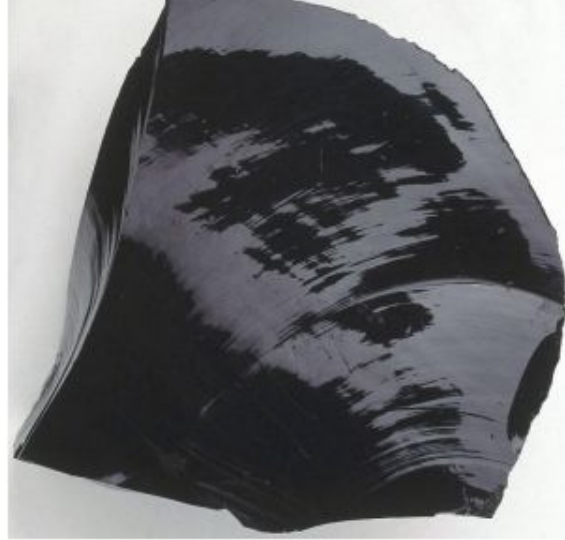
## 2 Types of Igneous Rocks

# Extrusive

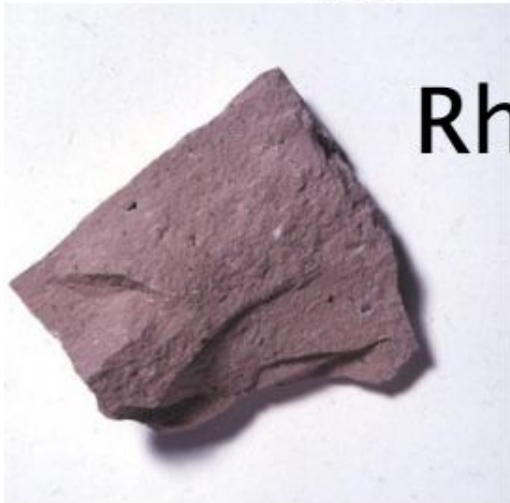
- ▶ Formed above the Earth's surface.
- ▶ Rocks cools quickly.
- ▶ They have small crystals.



**Basalt**



**Obsidian**



**Rhyolite**



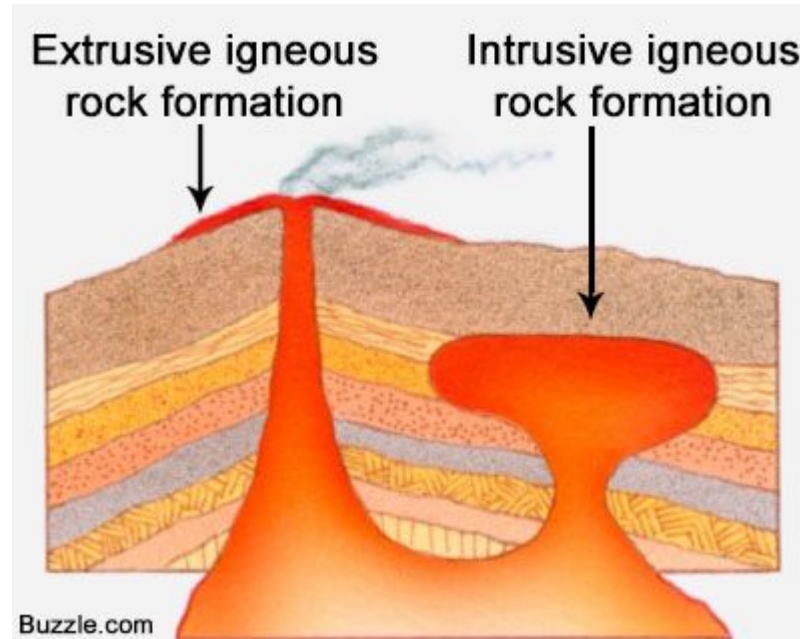
Describe the crystal size in each rock type:

Igneous Rock	Where rock forms	Crystal Size	Explain Crystal Size
Extrusive			
Intrusive			

Describe the crystal size in each rock type:

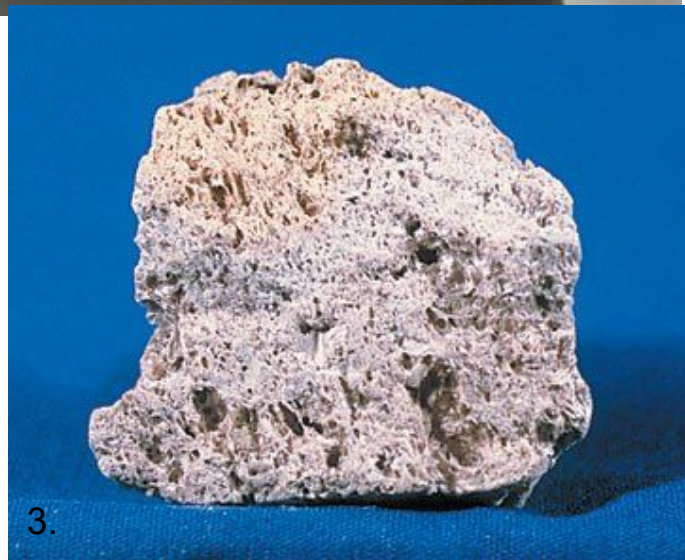
Igneous Rock	Where rock forms	Crystal Size	Explain Crystal Size
Extrusive	On earth	Small	Cools quickly in cold air
Intrusive	In Earth	Large	Cools slow in warm earth

Draw a diagram to show where extrusive and intrusive rock form.



# Igneous Rocks - practice!

Name of Rock	Does it contain air bubbles	Are crystals visible (if so state their color)	Size of each type of crystal in rok	Did the rock cool slowly or quickly	Intrusive or extrusive?
Basalt					
Obsidian					
Pumice					
Granite					



## 2. Sedimentary Rocks:

Form from the compaction and cementation (lithification) of sediments into visible layers called beds.

What is sediment formed from:

Come from the weathering and erosion of other rocks

What are the layers of sedimentary rocks called: Beds



# Sedimentary rocks are classified by grain size

	Size of grain (small, medium or large)	Sediment it is formed from? (pebbles, mud & silt, sand, Gravel, plant/animal parts)
Shale	Small	Mud and Silt

Shale



Use your browser's "back" button to return to the data page.

	Size of grain (small, medium or large)	Sediment it is formed from? (pebbles, mud & silt, sand, Gravel, plant/animal parts)
Sandstone	Medium	Sand

Sandstone

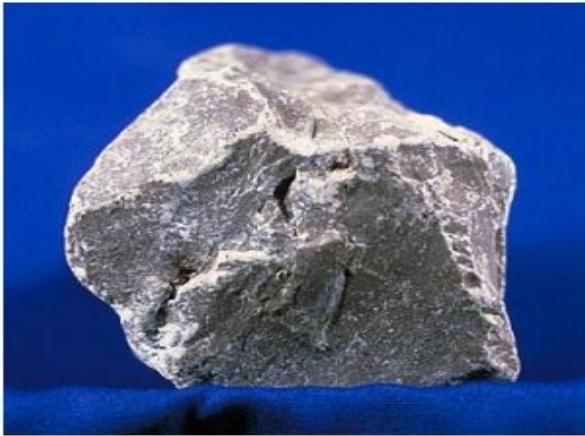


# Conglomerate

	Size of grain (small, medium or large)	Sediment it is formed from? (pebbles, mud & silt, sand, Gravel, plant/animal parts)
Conglomerate	Large	Gravel



	Size of grain (small, medium or large)	Sediment it is formed from? (pebbles, mud & silt, sand, Gravel, plant/animal parts)
Limestone	Small to large	Plant/animal parts



**Limestone**

### 3. Metamorphic

Result when pre-existing rocks (parent rocks) undergo changes due to heat, pressure and water.

- ▶ This is a long and slow process.

# Metamorphic Rocks

**Parent Rock:** The original rock that turns into a metamorphic rock

▶ Igneous



PARENT: Granite

▶ Metamorphic



Gneiss



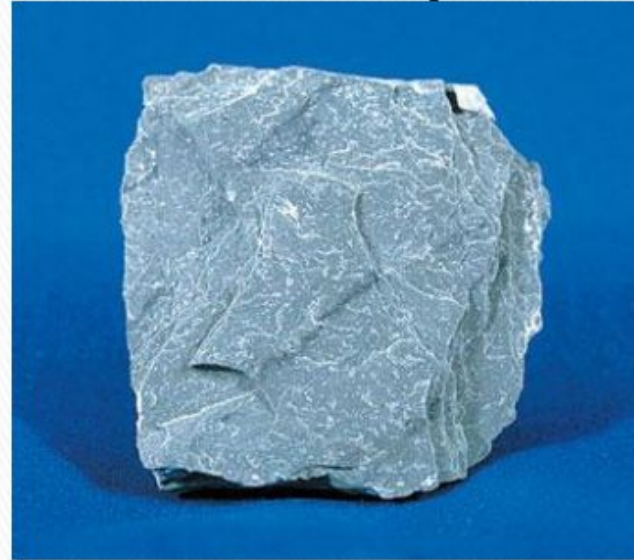
# Sedimentary ► PARENT: Shale

► Sedimentary



**PARENT: Shale**

► Metamorphic



**Slate**



Scratch off Sandstone!

▶ Sedimentary



PARENT: Limestone

▶ Metamorphic



Marble

# The Rock Cycle

- Rocks continue to change in ongoing processes called the rock cycle.
- The materials found in rocks undergo constant change to produce new rocks under different conditions.
- The matter in these rocks is neither created nor destroyed, it is just recycled.

