

## Physical Properties of Minerals



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## Physical Properties

- Hardness
- Colour
- Streak
- Lustre
- Cleavage
- Diaphaneity
- Parting
- Fracture
- Striations
- Magnetism
- Specific Gravity
- Crystal Form
- Aggregates
- Tenacity
- Acid Reaction
- Taste

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## Hardness

- Hardness is defined
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### Moh's Hardness Scale

Mineral	Hardness	Common material
Talc	1	Soft lead pencil
Gypsum	2	Chalk or finger nail
Calcite	3	Copper penny
Fluorite	4	Iron nail
Apatite	5	Steel knife blade
K Feldspar	6	Glass plate or steel file
Quartz	7	Garnet sandpaper
Topaz	8	
Corundum	9	Emery sandpaper
Diamond	10	

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### Colour

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### Colour

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## Colour

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- eg



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## Streak

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## Lustre

- Lustre is defined
- Lustre depends on

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**Lustre**

- Two main classes of lustre are:
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- eg.

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**Lustre**

Note Striations



**Metallic**                      **Nonmetallic**

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**Lustre**

- For nonmetallic lustres the following terms are used:
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### Cleavage

- Cleavage is
- Cleavage depends on
- Cleavage planes

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### Cleavage

- To describe cleavage
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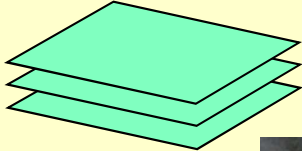
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Number of cleavage directions:  
Type:  
Example:



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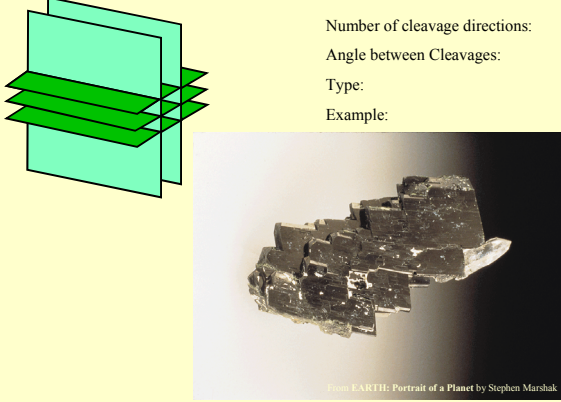
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Number of cleavage directions:  
Angle between Cleavages:  
Type:  
Example:

From: EARTH: Portrait of a Planet by Stephen Marshak  
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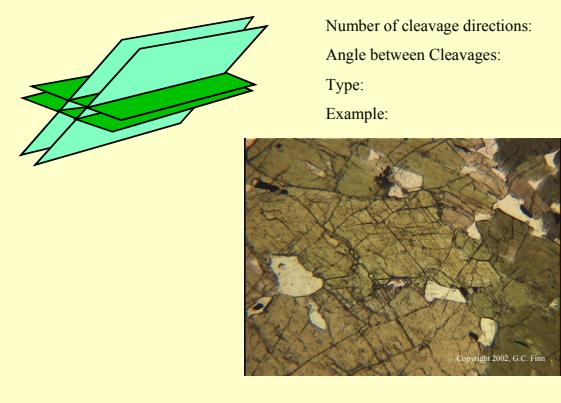
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Number of cleavage directions:  
Angle between Cleavages:  
Type:  
Example:

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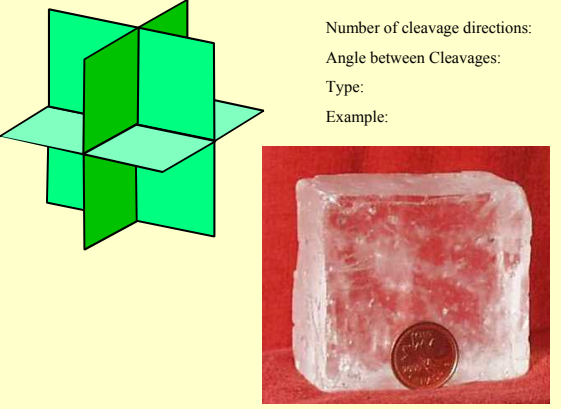
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Number of cleavage directions:  
Angle between Cleavages:  
Type:  
Example:

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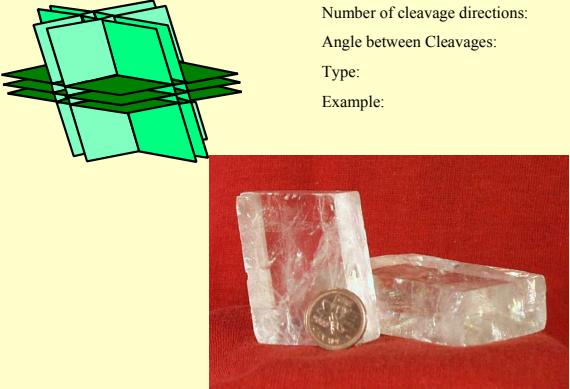
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Number of cleavage directions:  
Angle between Cleavages:  
Type:  
Example:

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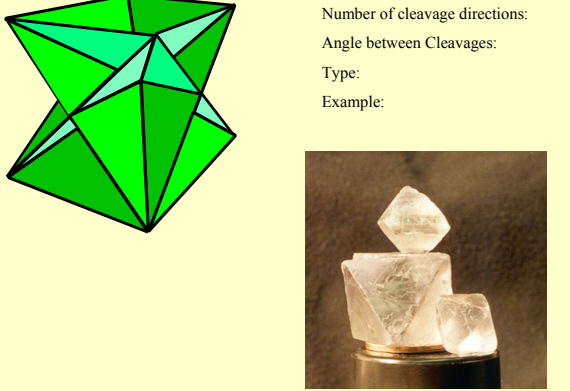
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Number of cleavage directions:  
Angle between Cleavages:  
Type:  
Example:

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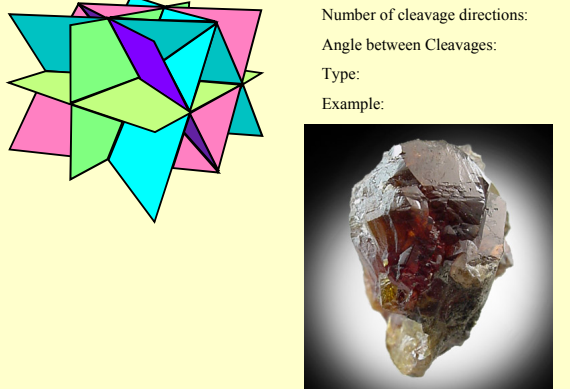
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Number of cleavage directions:  
Angle between Cleavages:  
Type:  
Example:

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### Diaphaneity

- The ability of a mineral
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  - eg.
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  - eg.
  - 
  - eg.



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### Parting

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### Fracture

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- Terms used to describe fracture:
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### Striations

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### Magnetism

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### Specific Gravity

- Specific gravity is
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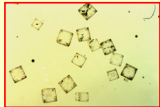
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### Crystal Form

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### Aggregates

- Mineral specimens are generally aggregates of imperfect crystals which may be arranged in a variety of ways to give the specimens different textures:
  - eg.
  - eg.
  - - eg.
  - eg.

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### Tenacity

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**Acid Reaction**

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**Taste**

- - eg.

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**Important Minerals**

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**Important Minerals**

- Quartz -  $\text{SiO}_2$
- Feldspars
  - alkali or potassium feldspars -  $\text{KAlSi}_3\text{O}_8$
  - plagioclase feldspar -  $(\text{Na,Ca})\text{Al}(\text{Al,Si})\text{Si}_2\text{O}_8$
- Pyroxene Group -  $\text{Ca}(\text{Mg,Fe})\text{Si}_2\text{O}_6$
- Amphibole Group -  
 $\text{NaCa}_2(\text{Mg,Fe,Al})_5(\text{Si,Al})_8\text{O}_{22}(\text{OH})_2$

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**Important Minerals (continued)**

- Mica Group
  - biotite -  $\text{K}_2(\text{Mg,Fe})_3\text{AlSi}_3\text{O}_{10}(\text{OH,O,F})_2$
  - muscovite -  $\text{KAl}_2(\text{AlSi}_3\text{O}_{10})(\text{OH})_2$
- Olivine -  $(\text{Fe,Mg})_2\text{SiO}_4$
- Garnet -  $(\text{Ca,Mg,Fe}^{2+},\text{Mn})_3(\text{Al,Fe}^{3+},\text{Cr})(\text{SiO}_4)_3$
- Kyanite, Andalusite, Sillimanite -  $\text{Al}_2\text{SiO}_5$
- Staurolite -  $\text{Fe}_2\text{Al}_9\text{O}_6(\text{SiO}_4)_4(\text{OH})_2$
- Chlorite -  $(\text{Mg,Al,Fe})_3(\text{Si,Al})_4\text{O}_{10}(\text{OH})_2^*(\text{Mg,Al,Fe})_3(\text{OH})_6$

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**Nonsilicates**

- Calcite -  $\text{CaCO}_3$
- Dolomite -  $(\text{Ca,Mg})\text{CO}_3$
- Gypsum -  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
- Apatite -  $\text{Ca}_5(\text{PO}_4)_3(\text{OH,Cl,F})$
- Halite -  $\text{NaCl}$
- Magnetite -  $\text{Fe}_3\text{O}_4$
- Hematite -  $\text{Fe}_2\text{O}_3$
- Pyrite –  $\text{FeS}_2$

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