

What Minerals Are in Your Cell Phone

According to the Mineral Information Institute:

- **Arsenic** (amplifier and receiver)
 - mined in China, Chile, Morocco, Peru, Kazakhstan, Russia, Belgium and Mexico.
- **Copper** (circuitry)
 - mined in Chile, United States, Peru, China, Australia, Russia, Indonesia, Canada, Zambia, Poland, Kazakhstan and Mexico.
- **Gallium** (amplifier and receiver)
 - mined in China, Germany, Kazakhstan and Ukraine.
- **Gold** (circuitry)
 - mined in China, United States, Australia, South Africa, Peru, Russia, Canada, Uzbekistan, Ghana, Papua New Guinea, Indonesia, Brazil, Mexico and Chile.
- **Magnesium compounds** (phone case)
 - mined in China, Turkey, North Korea, Russia, Slovakia, Austria, Spain, Australia, Brazil, Greece, India and the United States.
- **Palladium** (circuitry)
 - mined in Russia, South Africa, Canada, United States and Zimbabwe.
- **Platinum** (circuitry)
 - mined in South Africa, Russia, Canada, Zimbabwe, United States and Colombia.
- **Silver** (circuitry)
 - mined in Peru, Mexico, China, Australia, Chile, Russia, United States, Poland, Bolivia and Canada.
- **Tungsten** (circuitry)
 - mined in China, Russia, Canada, Austria, Bolivia and Portugal.

The National Research Council (NRC) of the National Academies Critical Minerals Report states that cell phones also contain indium, titanium dioxide (for the dielectric heart of the phone), and indium tin oxide (in the liquid crystal display). Other essential components of the cellular telephone include ceramic magnetic switches that contain rare earth elements (REs) and indium and the base stations for the cell phone networks that also use the element indium, as well as tantalum.

About 130 million cell phones are retired annually in the United States. Collectively, these cell phones weigh about 14,000 metric tons. Annually retired cell phones contain almost 2,100 metric tons of copper, 46 metric tons of silver, 3.9 metric tons of gold, 2 metric tons of palladium, and 0.04 metric tons of platinum. That's a lot of minerals!

Source: excerpt of article printed in October 2012 MOROKS newsletter published by the Monrovia Rockhounds in Monrovia, CA.

Editor's Note: Kids, to see a great article about where and how we get copper—the most prevalent mineral in your cell phone—go to <http://www.mii.org/pdfs/copper.pdf>. There are some fun activities for you to do also.



Igneous Rock Hidden Message Puzzle

D S D O L E R I T E M M I N E
I I E O R B B A G M O E G T E
E O O R L O G Y I N S W I H E
R T E R P K I D Z S R S N O C
K U I M I E O O W R O A P R B
M R E T C T N B X H I U U S Y
M U G W A I E T T D L L M T X
T I K R T N C R I D P S I L E
D C T E A V O S G N W L C A Y
J L H B I N B B Y N I D E S G
S X V Z A O I O R E N T N A K
P E G M A T I T E A N W E B Y
E T I T O D I R E P C I R B U
W R H Y O L I T E C K L T G E
W Y D Q T R A C H Y T E I E K

ANORTHOSITE
DIORITE
GRANITE
PEGMATITE
RHYOLITE
TRACHYTE

BASALT
DOLERITE
MONZONITE
PERIDOTITE
SERPENTINITE

CARBONATITE
GABBRO
OBSIDIAN
PUMICE
SYENITE

HIDDEN MESSAGE: Start at the top and write the unused letters in the spaces below to reveal the hidden message.

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