



## CELL PHONE MINERALS

Cell phones are used for staying connected, Internet access, text messaging, playing games, various applications, entertainment and taking photos. They have mineral components that come from mining.

**Think About It:** Do cell phones have anything in common with rocks and minerals? Explain. \_\_\_\_\_

### Minerals and Elements in Cell Phone Parts

Arsenic	Amplifier, receiver
Copper	Electrical circuitry
Gallium	Amplifier, receiver
Gold	Electrical circuitry
Indium	Liquid Crystal Display (LCD screen)
Magnesium compounds	Phone casing
Palladium	Electrical circuitry
Platinum	Electrical circuitry
Silver	Electrical circuitry
Tin	Liquid Crystal Display (LCD screen)
Tungsten	Electrical circuitry



**Directions for Activity:** The table below lists many of the mineral resources needed to make cell phones, the percentage of the mineral resource imported by the United States and major sources. Use this table to answer the questions on the back of this page. Note: NA means not available (insufficient data), so leave this out of any calculations. With two tied for #1, the next one would be ranked #3.

### Cell Phone Mineral Resource Imports into the United States

Mineral Resource	Rank from lowest to highest % imported	Net % Imported	Major Sources	% Self Sufficiency (Subtract % imported from 100%)
ANTIMONY		87	China, South Africa, Bolivia, Russia	13
ARSENIC		100	China, Chile, Morocco, Russia	
BAUXITE AND ALUMINA		100	Australia, China, Brazil, Indonesia	
BERYLLIUM		10	United States, China, Mozambique	
COPPER		35	Chile, China, Peru, United States	
DIAMOND (dust, grit and powder)		85	Botswana, Congo (Kinshasa), Russia, Australia	
GALLIUM		99	China, Germany, Kazakhstan, Ukraine	
GOLD	1	0	China, Australia, United States, Russia	
GRAPHITE		100	China, India, Brazil, North Korea	
INDIUM		100	China, Canada, Japan, Republic of Korea	
IODINE		88	Chile, Japan, China, Azerbaiian, Russia	
IRON ORE	1	0	China, Australia, Brazil, India	
LEAD		2	China, Australia, United States, Mexico	
MAGNESIUM (compounds)		46	China, Russia, Turkey, Austria	
MANGANESE		100	South Africa, Australia, China, Gabon	
MICA, sheet		100	India, Russia	
NICKEL		49	Phillipines, Indonesia, Russia, Australia	
NIOBIUM (columbium)		100	Brazil, Canada	
PALLADIUM		54	Russia, South Africa, Canada, United States	
PLATINUM		91	South Africa, Russia, Zimbabwe, Canada	
QUARTZ CRYSTAL (industrial; cultured)		100	China, Japan, Russia (import sources)	
RARE EARTHS		NA	China, United States, Australia, India	
SILVER		57	Mexico, China, Peru, Australia	
TANTALUM		100	Mozambique, Brazil, Congo (Kinshasa)	
TIN		75	China, Indonesia, Peru, Bolivia	
TITANIUM (mineral concentrates)		77	South Africa, Australia, Canada, China	
TUNGSTEN		42	China, Russia, Canada, Austria, Bolivia	
ZINC		72	China, Australia, Peru, United States	



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### Fun Facts:

- Cell phones are really radios.
- The first cell phone call was made on April 3, 1973, by Martin Cooper, a Motorola engineer and executive. He wanted to make a mobile phone after seeing Captain Kirk's "communicator" on the 1960's TV show *Star Trek*.



1. Does the United States have the resources to make cell phones without using any mineral resources from imported sources? Explain your answer.

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2. Gold is important to conduct electricity in cell phones and computer circuit boards. What countries are major sources for gold? If you were going to be a gold miner in one of these countries, which one would you choose? Why?

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3. What is the fewest number of countries needed to get the mineral resources to make a cell phone? List the countries.

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4. Are there any mineral resources in a cell phone that the United States could get solely from a domestic source? Explain.

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5. Describe other uses you know for some of the mineral resources used in a cell phone.

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6. Explain why minerals and mining are important to you and your daily life.

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### Extension Activity

- Individually or in a small group, use the Internet to research how the minerals in a cell phone are mined. Create a diagram for each type of mining done to extract these minerals.
- Label stickers or "post-it" notes with the mineral resources listed in the table and place them on a world map to show the geographic distribution of major sources for the mineral resources needed to make cell phones.

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