



## TELEVISION MINERALS

## ANSWER KEY

Televisions are useful for getting up-to-date news, learning about different people or places, and for entertainment like playing video games, watching movies, cartoons or your favorite show. Televisions have mineral components that come from mining.

### Think About It:

Have you ever wondered how a television is made? What are the materials needed to make a TV? Where are these materials found and how do we get them? Answer the questions below using only your background knowledge.



A television contains copper, quartz, iron, gold, platinum, and silver in its parts. List any other uses you know for these mineral resources. **Examples:**

**Copper:** used in automobile motors, radiators, and brakes; electric cables, wires and switches; plumbing pipes, heating, roofing, jewelry and brass in musical instruments.

**Iron:** used in steel, magnets, auto parts, cosmetics and paints.

**Quartz:** used in glass, telescope lenses, watches, computers and paints.

**Gold:** used in computers, dental fillings, Olympic medals, Oscars, surgical instruments, jewelry and coins.

**Platinum:** jewelry, dental crowns and bridges, automobile exhaust systems, chemotherapy and pacemakers.

**For more ideas see:**

[www.MineralsEducationCoalition.org/minerals](http://www.MineralsEducationCoalition.org/minerals)

[www.nma.org/index.php/minerals-publicatons/40-common-minerals-and-their-uses](http://www.nma.org/index.php/minerals-publicatons/40-common-minerals-and-their-uses)

[www.Geology.com/minerals](http://www.Geology.com/minerals)

[www.chemicool.com/elements](http://www.chemicool.com/elements)

What other electronic devices might use similar mineral resources to those in a television?

Student ideas might include things like cell phones, tablets, MP3 players, computers, video gaming systems, DVRs, cameras, GPS devices, car stereo systems, microwaves, etc.

Why do you think copper, gold and quartz are used in televisions?

Copper and gold are excellent conductors of electricity and resist corrosion.

Quartz sand is used in making glass, such as a television screen. Quartz crystal is used in precision instruments like watches and TVs because under mechanical pressure it can emit an electrical signal with a steady, rhythmic frequency.

### Directions for Activity:

The table on the back of this worksheet lists many of the mineral resources needed to make a TV, the percentage of the mineral resource imported by the United States and major sources. Answer the questions on the back of this sheet using the table. Note: NA means not available (insufficient data), so leave this out of any calculations.



### Fun TV Facts:



The largest plasma television in the world is a 152-inch TV made by Panasonic and priced at \$500,000!



The first TV commercial ran during a Brooklyn Dodgers and Philadelphia Phillies baseball game in 1941. The commercial was for Bulova watches, and cost \$9 for the spot. A 30-second ad in the Super Bowl today can cost several million dollars.

### TV Mineral Resource Imports into the United States

Mineral Resource	Net % Imported by U.S.	Major Sources	% Self Sufficiency (Subtract % imported from 100%)
ANTIMONY	87	China, South Africa, Bolivia, Russia	13
BARITE	80	China, India, United States, Morocco	20
BAUXITE and ALUMINA	100	Australia, China, Brazil, Indonesia	0
BERYLLIUM	10	United States, China, Mozambique	90
COBALT	78	Congo (Kinshasa), China, Canada, Russia	22
COPPER	35	Chile, China, Peru, United States	65
GALLIUM	99	China, Germany, Kazakhstan, Ukraine	1
GERMANIUM	90	China, Russia, United States	10
GOLD	0	China, Australia, United States, Russia	100
INDIUM	100	China, Canada, Japan, Republic of Korea	0
IRON ORE	0	China, Australia, Brazil, India	100
LEAD	2	China, Australia, United States, Mexico	98
MANGANESE	100	South Africa, Australia, China, Gabon	0
MICA, sheet	100	India, Russia	0
NIOBIUM (columbium)	100	Brazil, Canada	0
PALLADIUM	54	Russia, South Africa, Canada, United States	46
PLATINUM	91	South Africa, Russia, Zimbabwe, Canada	9
POTASH	81	Canada, Russia, Belarus, China	19
QUARTZ CRYSTAL (industrial; cultured)	100	China, Japan, Russia	0
RARE EARTHS	NA	China, United States, Australia, India	NA
RHENIUM	78	Chile, United States, Poland, Kazakhstan	22
SILICON (ferrosilicon)	<60	China, Russia, United States, Brazil	>40
STRONTIUM	100	China, Spain, Mexico, Argentina	0
TANTALUM	100	Mozambique, Brazil, Congo (Kinshasa), Rwanda	0
TIN	75	China, Indonesia, Peru, Bolivia	25
TITANIUM (mineral concentrates)	77	South Africa, Australia, Canada, China, India	23
TUNGSTEN	42	China, Russia, Canada, Austria, Bolivia	58
VANADIUM	96	China, South Africa, Russia, United States	4
ZINC	72	China, Australia, Peru, United States	28

Source: USGS Mineral Commodity Summaries 2013

1. Could the United States make televisions without using any mineral resources from other countries? **No**. Explain your answer. **Eight of the necessary minerals are currently 100% imported.**

2. What is the fewest number of countries needed to get the mineral resources to make a TV? **Three**. List the countries. **China, Russia and Brazil.**

3. Copper is important for electricity conduction in televisions. What countries are major sources for copper? **Chile, China, Peru, and the United States**. If you were going to be a copper miner in one of these countries, which one would you choose and why? \_\_\_\_\_

4. Mining involves prospecting, extracting, and processing mineral resources. If you were a miner, which step would you choose for your work and why? \_\_\_\_\_

5. Describe why mining and minerals are important to you and your life. \_\_\_\_\_

#### Extension Activity:

Research local mines to find out if any of these minerals are mined near you. Can you find out where the minerals are sent for processing? To be used in manufacturing? Interview a local miner about his or her work.

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