

## SOCCER MINERALS

## ANSWER KEY

Soccer is a global sport played professionally and for fun. It is more commonly known as "football" in all countries except the United States of America. Today, soccer equipment and soccer fields are made with materials that come from mining.

**Think About It:** Does soccer have anything in common with rocks or minerals? Explain your answer using only your background knowledge. **Ask students this question before showing them the activity pages. Assist students in discussing the equipment needed to play soccer and in brainstorming what parts of these items might come from rocks or minerals. They may be able to guess a type of metal for the goal posts (for example).**

**Mineral Resources Needed for Playing Soccer**

Mineral Resource	Net % Imported	G	B	Major Sources	% Self Sufficiency (Subtract % Imported from 100%)
		u	a		
		a	i		
		r	s		
		d			
		s			
ANTIMONY	87	X	X	China, South Africa, Bolivia, Russia	13
ASBESTOS	100			Russia, China, Brazil, Kazakhstan	0
BARITE	80		X	China, India, Morocco, United States	20
BAUXITE and ALUMINA	100		X	Australia, China, Brazil, Indonesia	0
BERYLLIUM	10			United States, China, Mozambique	90
BORON (boric acid)	0	X		Turkey, United States, Argentina, Chile, Russia	100
CHROMIUM	70			South Africa, Kazakhstan, India	30
COBALT	78	X	X	Congo, China, Canada, Russia	22
COPPER	35			Chile, China, Peru, United States, Australia	65
FLUORSPAR	100	X		China, Mexico, Mongolia, South Africa	0
GRAPHITE	100			China, India, Brazil, North Korea	0
GYPSTUM	12	X	X	China, Iran, Spain, Thailand, United States	88
IODINE	88			Chile, Japan, China, Azerbaijan, Russia	12
IRON ORE	0			China, Australia, Brazil, India, Russia	100
LIME	1	X	X	China, United States, India, Russia, Japan	99
MAGNESIUM (compounds)	46		X	China, Russia, Turkey, Austria	54
MANGANESE	100	X	X	South Africa, Australia, China, Gabon	0
MICA (scrap and flake)	31	X	X	China, Russia, Finland, United States	69
MOLYBDENUM	0			China, United States, Chile, Peru, Mexico	100
NITROGEN (fixed, ammonia)	35			China, India, Russia, United States	65
PHOSPHATE ROCK	5			China, United States, Morocco, Russia	95
POTASH	81	X	X	Canada, Russia, Belarus, China, Germany	19
QUARTZ (industrial sand)	0	X		United States, Italy, Germany, Australia	100
SALT	19	X	X	China, United States, Germany, India	81
SELENIUM (from copper refineries)	0			United States, Germany, Japan, Belgium, Russia	100
SILICON (ferrosilicon)	<60		X	China, Russia, United States, Brazil, France, Norway	>40
SULFUR	19	X	X	China, United States, Russia, Canada, Saudi Arabia	81
TALC and PYROPHYLLITE	2	X		China, Brazil, India, United States, South Korea	98
TITANIUM (mineral concentrates)	77		X	South Africa, Australia, Canada, China, India	23
ZINC	72		X	China, Australia, Peru, United States, India	28

Source: USGS Mineral Commodity Summaries 2013

**Directions for Activity:** The table above lists some of the mineral resources needed to play soccer, the percentage of the resource that is imported by the United States and major sources. Use the table above and the figure on the next page to answer the questions.

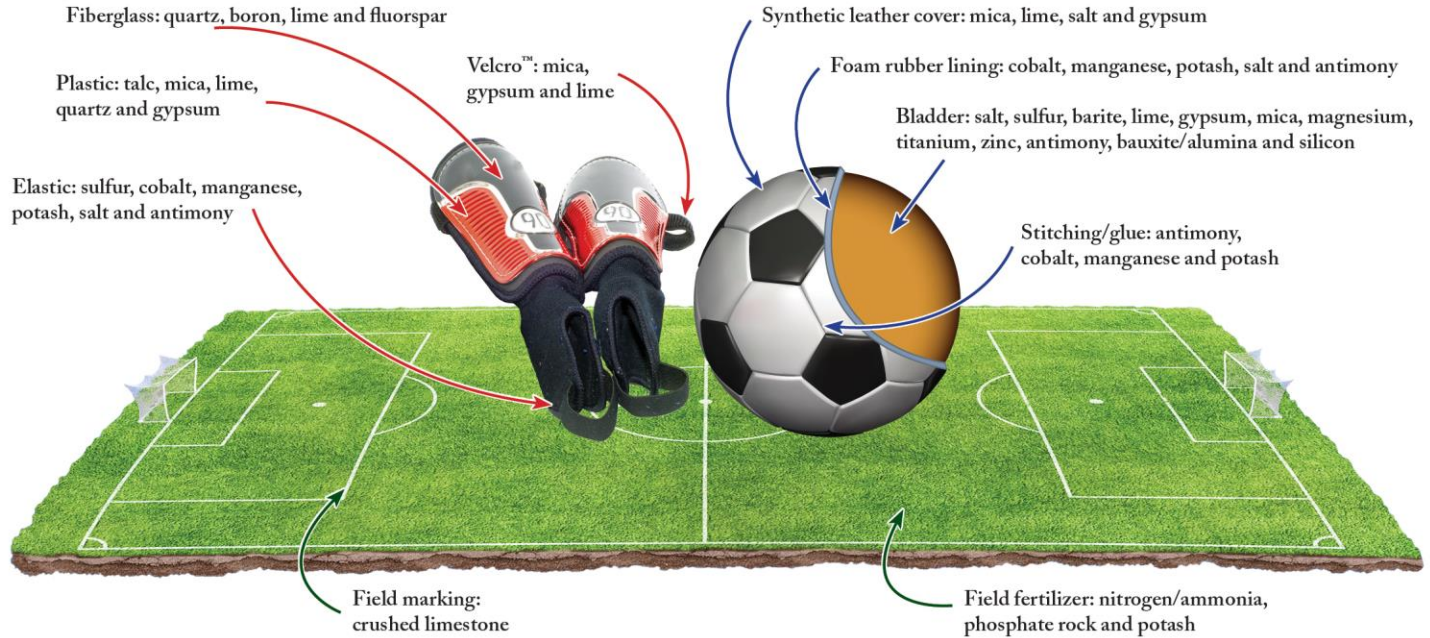


### FUN FACTS:

- ♦ The oldest soccer ball in the world is 450 years old, made from deer skin and a pig's bladder filled with air. It's on display in a museum in Scotland.
- ♦ The highest scoring professional soccer game was 149-0 in 2002. The losing team scored over 100 goals on itself to protest bad refereeing.
- ♦ Soccer is the most played and most watched sport on Earth.

### Shin Guards

### Soccer Ball



1. What is the fewest number of countries needed to make a soccer ball and a pair of shin guards? **Using the table provided, two: China and the United States. [Mark the columns on the front page for Guards and Balls to help solve this.]**
2. Lime (as a processed limestone product) is used in making synthetic materials, such as the rubber and plastic used to make soccer equipment. The white powder for marking the lines on a sports field is from crushed limestone. If you were a lime producer, in what countries could you live? **China, United States, India, Russia and Japan would be options since they were the top sources of lime.** Which would you choose to live in and why? \_\_\_\_\_
3. List the three countries that have the most mineral resources needed to make a soccer ball. **China, United States and Russia.** \_\_\_\_\_
4. Could any of the countries listed make shin guards without using imported mineral resources? **Possibly not.** Explain. **None of the countries are top sources of all of the minerals needed to make shin guards, though they could still be lesser sources of the minerals (more details at <http://minerals.usgs.gov/minerals/pubs/mcs/2013/mcs2013.pdf>).**
5. If you were a professional soccer player, why would mining and minerals be important to you and your job? **Because mining provides crucial minerals for making soccer balls, shin guards, field markings and field fertilizer.**

### Two Extension Activities

- Research the minerals needed to make soccer cleats, nets and goal posts.
- 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 for playing soccer. [www.MineralsEducationCoalition.org](http://www.MineralsEducationCoalition.org)

