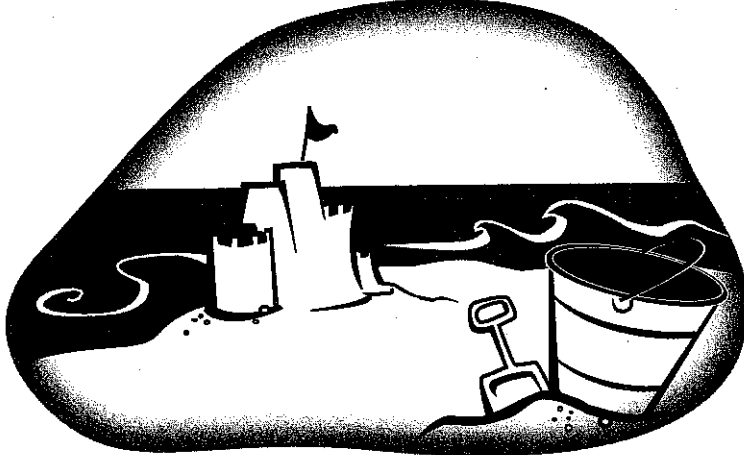


# Beach Sand



Three friends were walking along a beach in New England. They looked closely at the sand and noticed it was made up of tiny particles of rock. They had different ideas about where the sand came from.

Molly: "I think the sand came from distant mountains and landforms."

Fidel: "I think the sand came from rocks on the ocean floor."

Lynn: "I think the sand came from undersea mountains and sea floor formations."

Which friend do you agree with and why? Explain your thinking about how the sand formed *and* ended up on the beach.

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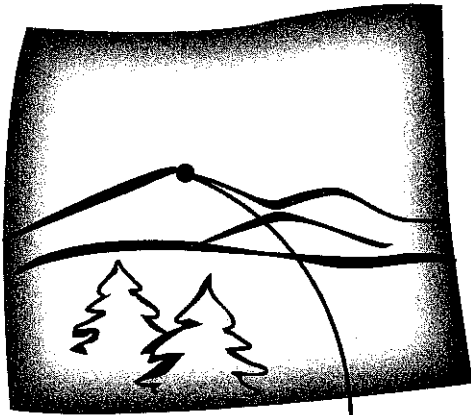
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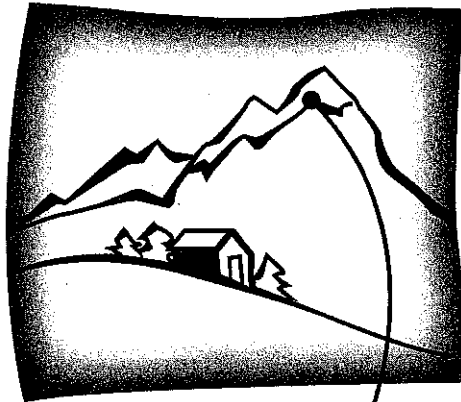
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# Mountain Age



Mountain A



Mountain B

Mountain A is 4,800 feet tall, looks smooth and rounded, and is located in North America. Mountain B is 19,280 feet tall, looks sharp and jagged, and is located in South America. Both mountains were originally formed by the uplifting of the Earth's crust millions of years ago, are composed of similar material, and are found in similar climate conditions.

Put an X next to the statement that best describes your thinking about the age of the two different mountains based on their shape and height.

- Mountain A is probably younger than Mountain B.
- Mountain A is probably older than Mountain B.
- Mountains A and B are the same age.

Describe your thinking. Provide an explanation for your answer.

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# Is It a Rock? (Version 1)

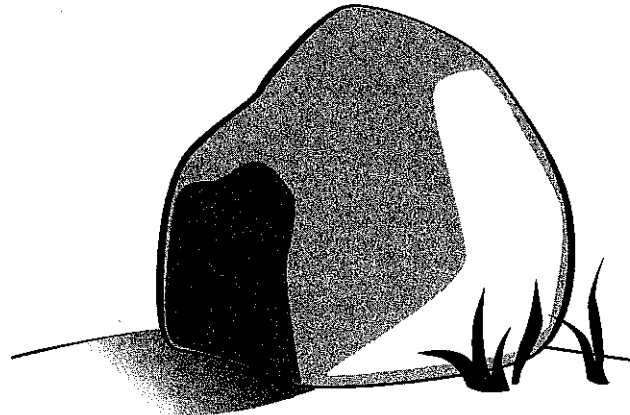
Which things on this list could be rocks? How do you decide if something is a rock?  
Put a X next to the things you think could be a rock.

jagged boulder     smooth boulder

small stone     large stone

pebble     piece of gravel

piece of sand     dust from two stones rubbed together



Explain your thinking. What "rule" or reasoning did you use to decide if something is a rock?

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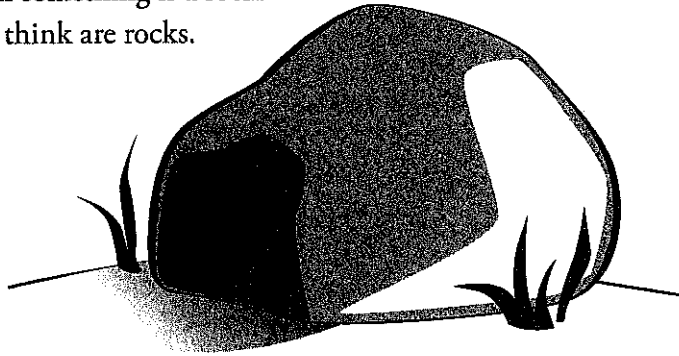
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# Is It a Rock? (Version 2)

What is a rock? How do you decide if something is a rock?  
Put an X next to the things that you think are rocks.



- |   |  |  |
|---|--|--|
| <input type="checkbox"/> cement block       | <input type="checkbox"/> piece of clay pot | <input type="checkbox"/> coal          |
| <input type="checkbox"/> dried mud          | <input type="checkbox"/> coral             | <input type="checkbox"/> brick         |
| <input type="checkbox"/> hardened lava      | <input type="checkbox"/> limestone         | <input type="checkbox"/> a gravestone  |
| <input type="checkbox"/> asphalt (road tar) | <input type="checkbox"/> iron ore          | <input type="checkbox"/> marble statue |
| <input type="checkbox"/> glass              | <input type="checkbox"/> concrete          | <input type="checkbox"/> granite       |

Explain your thinking. What "rule" or reasoning did you use to decide if something is a rock?

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# Where Would It Fall?

Six friends were talking about asteroids and meteorites that could fall to the Earth. The friends wondered where an object from space would most likely fall. This is what they said:



**Maya:** "I think it has the greatest chance of landing in a desert."

**Elsa:** "I think it is most apt to land where humans are living."

**Walter:** "I think it will most likely land in an ocean."

**Mac:** "I think it will probably land on an ice-covered area."

**Amber:** "Chances are it will land on the largest continent."

**Evan:** "Most likely it will land in a body of freshwater."

Which person do you most agree with? Explain your reasons for where you think a large object from space would most likely fall.

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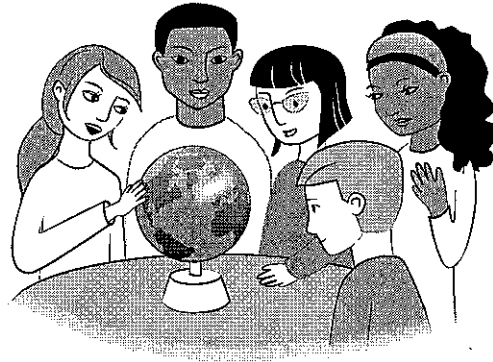
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# Is Earth Really “Round”?



Five friends were talking about the shape of the Earth. They each agreed the Earth is round. However, they disagreed about what “round” really means. Here are their ideas about a “round” Earth:

**Chuck:** “I read somewhere that Columbus or Magellan or someone proved the Earth is round like a round island. He sailed all around the island, and came back to the same port.”

**Sara:** “I know the Earth doesn’t look round. That’s just because we live in a flat area. Other people can see it’s round because they live near mountains and hills.”

**Takesha:** “‘Round’ means that the whole Earth is shaped like a ball. It just looks flat because we can only see a small part of the ball.”

**Arnold:** “You’re right that ‘round’ means ‘round like a ball,’ but it looks flat because we live on the flat part in the middle. The upper part of the ball is the sky, and the bottom part is the solid Earth, where people live.”

**Missy:** “Everyone knows that the round Earth is a planet in the solar system, like Mars and Jupiter. People get mixed up because ‘earth’ is also another name for the ground.”

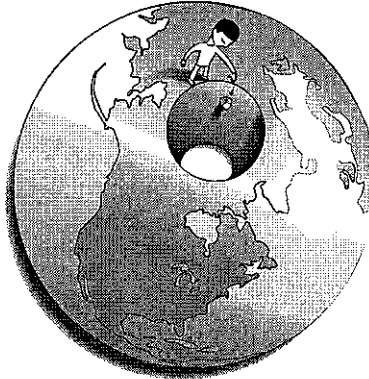
Who do you think has the best explanation? \_\_\_\_\_ Explain why you think it is the best explanation, and use a drawing to support your explanation.

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Include a drawing on the back of this page.

# Falling Through the Earth



A teacher asked her students to imagine that it was possible to drill a hole all the way through the Earth from the North Pole to the South Pole. The hole is lined with super-strong steel so that it does not collapse or melt. There is air inside the hole. She asked the students to discuss what would happen to a rock that is dropped into the hole. Here is what they said:

**Alana:** "It would fall into the hole and would just keep going until it hit something."

**Nate:** "It would just fall straight down and come out the other side."

**Tess:** "I bet it would come out the bottom of the Earth and just keep falling forever into space."

**Tim:** "It will go to the center of the hole and stop."

**Jean:** "It will pass through the center, slow down, and fall back toward the center again."

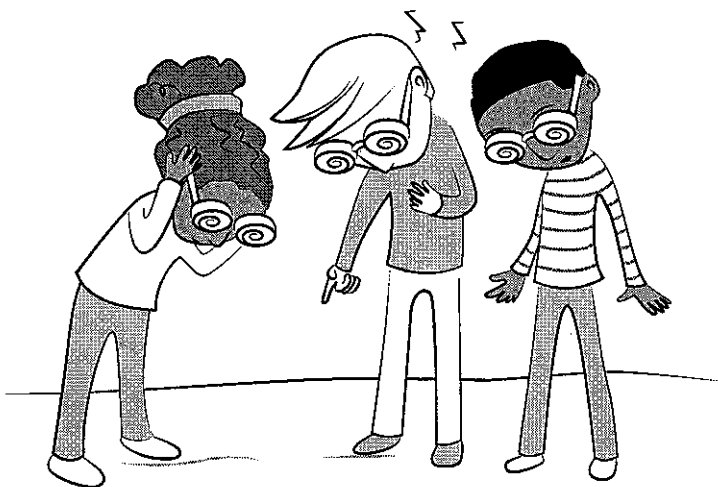
**Frank:** "It's probably just going to stick to the side somewhere." Whom do you agree with the most? \_\_\_\_\_ Explain why you agree.

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# Where Do People Live?



Three friends were arguing about what they would see if they could look straight through the Earth using x-ray vision. Here is what they said.

**Jimmy:** “If I looked down I would see people on the other side of the Earth. In fact, I would see the bottoms of their shoes.”

**Farouk:** “I agree with Jimmy that we would see people on the other side of the Earth. But I think we would see the tops of their heads.”

**Sadi:** “I disagree with both of you. There is nothing down under us except for dirt and rocks.”

Which friend do you agree with the most? \_\_\_\_\_ Explain why you agree with that friend and not the others.

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