Weekly Question

What causes earthquakes?

Until the 1960s, scientists thought that Earth’s crust was continuous and unbroken. Now they accept the theory that Earth’s crust is broken into many irregularly shaped pieces called **plates**. There are eight large plates and a number of smaller ones. All the land and oceans lie on top of these plates. Beneath the plates is the hot, soft mantle. Because it is soft, the mantle moves, and it carries the plates along with it. So even though we don’t feel it, the ground under our feet is moving all the time.

A. Use the map to find where you live. Write the name of the plate you are on.

B. Complete the analogy.

   *Earth’s plates are to mantle as _____.*

   - raft is to water  
   - car is to road  
   - hawk is to air  
   - rocket is to outer space

C. Write true or false.

1. Earth’s crust is broken into plates.  
   
2. Only continents lie on Earth’s plates.  
   
3. The mantle is soft.  
   
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Weekly Question
What causes earthquakes?

The movement of plates can be gradual or sudden. When plates move suddenly, an earthquake happens. Part of the ground may lift up several feet, or cracks in the earth may appear. The place where Earth’s crust breaks is called a fault. A famous plate boundary is the San Andreas Fault in California. Here, one plate is moving north while the other moves south.

A. Use the diagram to answer the questions.

1. In which direction is this part of the Pacific Plate moving—north, south, east, or west? ________________

2. Which cities would be affected by a major earthquake along the San Andreas Fault? ________________

B. Use information from the passage to complete the sentences.

1. Earthquakes happen when ________________ move suddenly.

2. A crack in the ground that runs for at least several miles is probably a ________________.

Vocabulary
boundary
BOWN-dree
border or edge
fault
fawlt
a break in Earth’s crust where blocks of rock are moving in different directions
**Weekly Question**

**What causes earthquakes?**

Plates move in all different directions. Plates sometimes slide past each other, like they do along the San Andreas Fault in California. Plates also collide, or run into each other. When plates collide, they cause powerful earthquakes and can even build mountains. The Himalaya Mountains in Asia are the result of two plates pushing together.

In other places, plates move apart from each other. This does not cause very strong earthquakes, but ocean basins are often created when two plates pull apart.

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**A.** On the line below each picture, write whether the diagram shows plates *sliding past each other, colliding, or moving apart.*

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**B.** Write true or false.

1. Powerful earthquakes are generated as plates move apart.  
   
2. Oceans are always created by plates colliding.  

3. The San Andreas Fault is an example of mountain-building.  

4. Plates sliding past each other can generate earthquakes.
**Weekly Question**

What causes earthquakes?

Scientists study earthquakes with a tool called a **seismometer**, which records movements in the ground. In 1935, a scientist named Charles Richter invented a system of measuring earthquakes. This is called the Richter scale. An earthquake gets a number between 1 and 10 to describe its **magnitude**. A magnitude 1 earthquake is so weak that you can’t feel it, while an 8.0 would knock you off your feet! Since scientists began using the Richter scale, the strongest earthquake ever recorded was a 9.5 in Chile in 1960.

Use the information in the chart to complete the sentences.

<table>
<thead>
<tr>
<th>Richter Scale Magnitude</th>
<th>Average Number of Earthquakes</th>
<th>Earthquake Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0–2.9</td>
<td>1,300,000 per year</td>
<td>Not felt but are recorded on seismometers</td>
</tr>
<tr>
<td>3.0–3.9</td>
<td>130,000 per year</td>
<td>Barely noticeable; hanging objects may swing</td>
</tr>
<tr>
<td>4.0–4.9</td>
<td>13,000 per year</td>
<td>Most people notice them; buildings shake</td>
</tr>
<tr>
<td>5.0–5.9</td>
<td>1,300 per year</td>
<td>Everyone notices them; windows may break</td>
</tr>
<tr>
<td>6.0–6.9</td>
<td>134 per year</td>
<td>Walls may crack; chimneys may fall</td>
</tr>
<tr>
<td>7.0–7.9</td>
<td>18 per year</td>
<td>Ground cracks; weak buildings fall down</td>
</tr>
<tr>
<td>8.0–8.9</td>
<td>1 per year</td>
<td>Many buildings fall; bridges collapse</td>
</tr>
<tr>
<td>9.0–9.9</td>
<td>1 per 20 years</td>
<td>Complete devastation over a wide area</td>
</tr>
<tr>
<td>10.0+</td>
<td>Extremely rare</td>
<td>Never recorded</td>
</tr>
</tbody>
</table>

1. Earthquakes of magnitude 9 happen at a rate of about ______
   every _______ years.

2. Usually, an earthquake must be at least magnitude _______ to cause any buildings to collapse.

3. Most people notice earthquakes that are magnitude _______ or greater.

4. The number of earthquakes between a magnitude of 3.0 and 6.9 that happen every year is about ________

**Vocabulary**

- **magnitude**: MAG-nu-tood a measure of the amount of energy released by an earthquake
- **seismometer**: size-MAH-muh-ter a tool that records movements in Earth’s crust