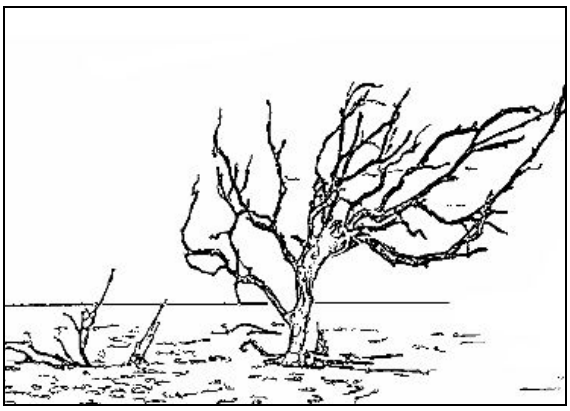
# Paquete de Actividades de Maggie

Nombre _____

## Mares Crecientes

Maggie y su amiga Roscoe fueron a la playa. Ellas vieron árboles muertos. ¿Qué pasó con los árboles? Antes, los árboles estaban más lejos de la playa. El agua salada y la arena se movieron hacia donde estaban los árboles. Los árboles murieron. La playa está ahora donde vivían los árboles. ¿Qué movió la arena y el agua salada? ¡El océano lo hizo! El océano se elevó y se movió hacia la tierra. Esto se llama aumento del nivel del mar. El nivel del mar está empezando a subir más ahora. ¿Qué está causando esto? ¡La Tierra se está calentando más rápido! ¿Pero por qué?



La gente usa aceite y gasolina. Esto crea un gas que atrapa más calor en la Tierra. ¡La temperatura sube más! Pero, ¿cómo hace esto que el océano suba? El exceso de calor hace que el hielo y la nieve se derritan más rápido, así, más agua corre cuesta abajo hacia el océano y la llena más.

**Instrucciones: Conteste las siguientes preguntas.**

1) ¿Qué pasó finalmente con los árboles?

A) Ellos crecieron más altos.

B) Vivían bajo el agua.

C) Se alejaron del océano.

D) Murieron por demasiada sal y arena.

2) Las ciudades cercanas al océano se están cubriendo más con agua. ¿Por qué crees que es esto?

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# TEACHER GUIDE

**Activity At-A-Glance:**
Climate change involving global warming has been taking place during the current interglacial period that began about 12,000 years ago. Glacial and interglacial periods have been alternating during ice ages for millions of years. Scientists believe that ice ages, and the forward advance and retreat of glaciers during these ice ages, is affected by cyclical variations in Earth's tilt, Earth wobbling on its axis, and changes in the eccentricity of its orbit. These factors affect the amount of incoming solar radiation that Earth receives over time. Temperatures rose rapidly at the beginning of the current interglacial period but then almost leveled off for the last several thousand years. When the Industrial Revolution began about 200 years ago, global temperatures starting rising more rapidly and have accelerated even more in the past several decades. Very comprehensive scientific research indicates that the probability of this recent accelerated global warming being caused primarily by astronomical and other natural factors is very, very, low. As fossil fuels have been burning for the last couple of centuries, the amount of carbon dioxide ($CO_2$) in the atmosphere has risen about 40%. According to millions of years of ice core data, this rise in $CO_2$ levels in such a short period of time is unprecedented. $CO_2$ is a greenhouse gas that traps infrared radiation being re-radiated by the Earth and keeps it from escaping into space. As global temperatures rise more rapidly due to $CO_2$ emissions, sea level rise eventually accelerates as a result due to the expansion of warmer water and increased meltwater flowing from retreating glaciers. During the 20th century, sea level rise was almost 20 centimeters (cm), but is predicted to be about 2-4 times that much in the 21st century. Since billions of people live within 100 kilometers (km) of the coastline, this is an issue for future generations to be concerned about.

**Standards:**
- Next Generation Science Standards (NGSS):
  - K-PS2.B Types of Interactions [DCI]
  - K-ESS3.C Human Impacts on Earth Systems [DCI]
  - K-ESS3 Cause and Effect [Crosscutting Concept]
- Common Core State Standards (CCSS) for ELA:
  - RI Key Ideas and Details

**Background Information:**
For more information about this topic, please see the Intermediate reader version of this activity.

**Clave de respuestas: Instrucciones: Responda las siguientes preguntas.**

1) ¿Qué pasó finalmente con los árboles?
   A) Crecieron más altos.
   B) Vivían bajo el agua..
   C) Se alejaron del océano.
   **D) Murieron por demasiada sal y arena.**

2) Las ciudades cercanas al océano se están cubriendo más con agua. ¿Por qué crees que es esto? ***La gente está usando aceite y gasolina. Esto envía un gas al aire que atrapa más calor. Las temperaturas suben más rápido que antes. Más hielo y nieve se derriten. Más agua fluye cuesta abajo hacia el océano. El mar sube más y cubre la tierra cerca del océano.***

**Take it Outdoors:**
Have your students pretend your school was in Miami Beach, 1 meter (m) or 3.28 feet (ft.) above sea level. Explain to students that a 1 m rise in sea level by the year 2100 is an average estimation by scientists. This would mean that sea level would be at the base of the building. Take your students outside and show them (or have them measure) where sea level would be on the side of the building for different years using the following average estimates:

2100 - 1.0 meters (m) above current sea level or at the base of the building
2120 - 1.3 meters (m) above current sea level or 30 centimeters (cm) from the ground
2150 - 1.8 meters (m) above current sea level or 80 centimeters (cm) from the ground
2200 - 2.8 meters (m) above current sea level or 180 centimeters (cm) from the ground

Have students think about what this mean for schools and other buildings in Miami Beach and other coastal cities. Consider discussing options to prevent or at least delay this flooding scenario in the future.

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