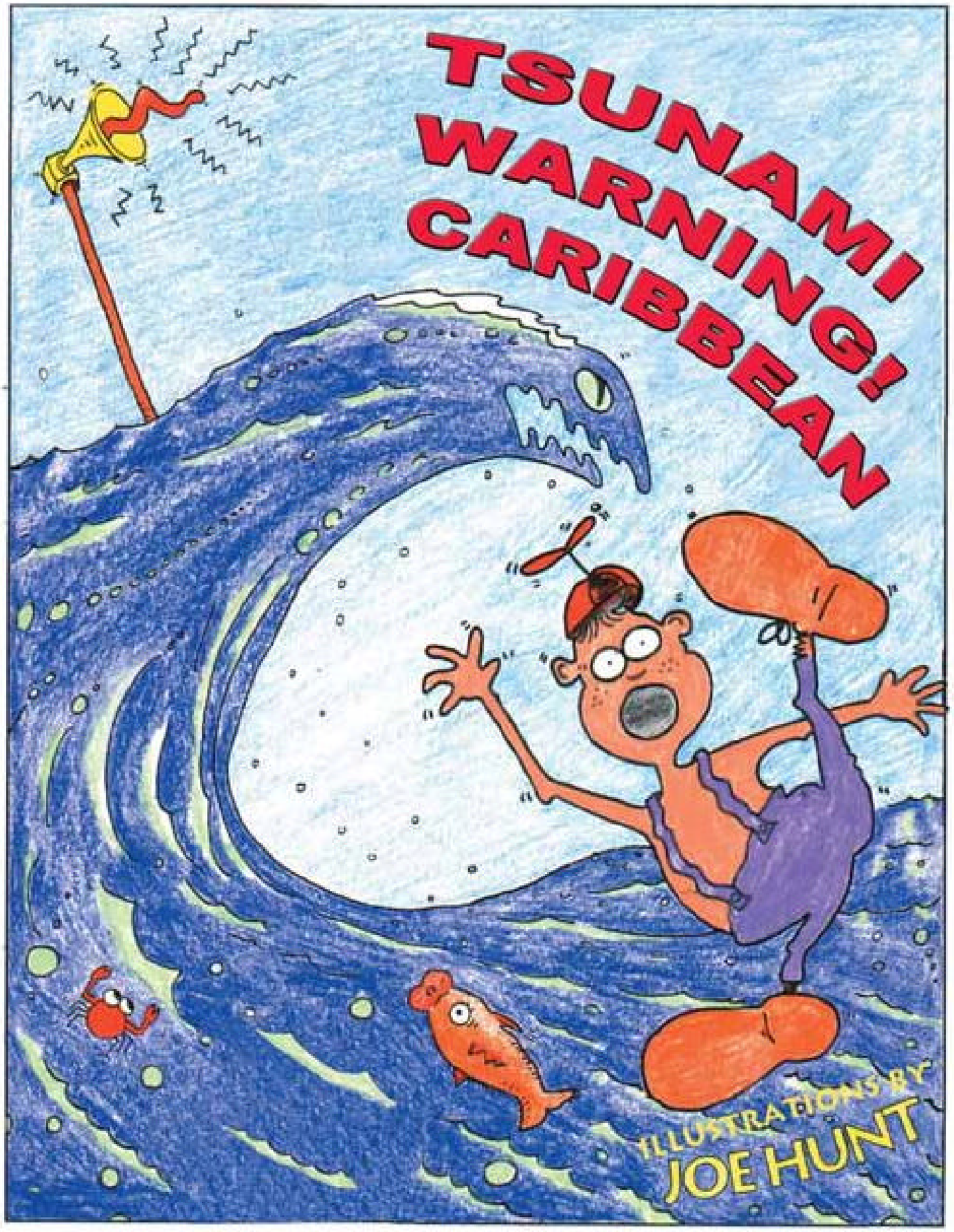

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The Caribbean Disaster Emergency Management Agency

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TSUNAMI SMART

ACKNOWLEDGMENTS

The International Coordinating Group for the Tsunami Warning System in the Pacific of the Intergovernmental Oceanographic Commission of UNESCO, at its Thirteenth Session in Ensenada, Mexico (September 1991), encouraged the preparation of a book designed to inform young persons about tsunamis, the dangers which they present, and what should be done to save lives and property.

The authors of the original book are Dr. George Pararas-Carayannis, Ms. Patricia Wilson, and Mr. Richard Sillcox, and the original illustrations were created by Mr. Joe Hunt.

This edition was adapted for the English-speaking Caribbean through the Tsunami and Other Coastal Hazards Warning System Project which was implemented by the Caribbean Disaster Emergency Management Agency (CDEMA) with co-funding from the United States Agency for International Development. The story was adapted for the Caribbean context by The University of the West Indies Seismic Research Centre with Caribbean-themed illustrations by Ms. Isiaa Madden-Brownie.

To learn more about tsunamis and what you should do when a tsunami is coming, we encourage you to read *The Great Waves.*

Printed by: Caribbean Disaster Emergency Management Agency (CDEMA)

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United Nations Educational, Scientific and Cultural Organization

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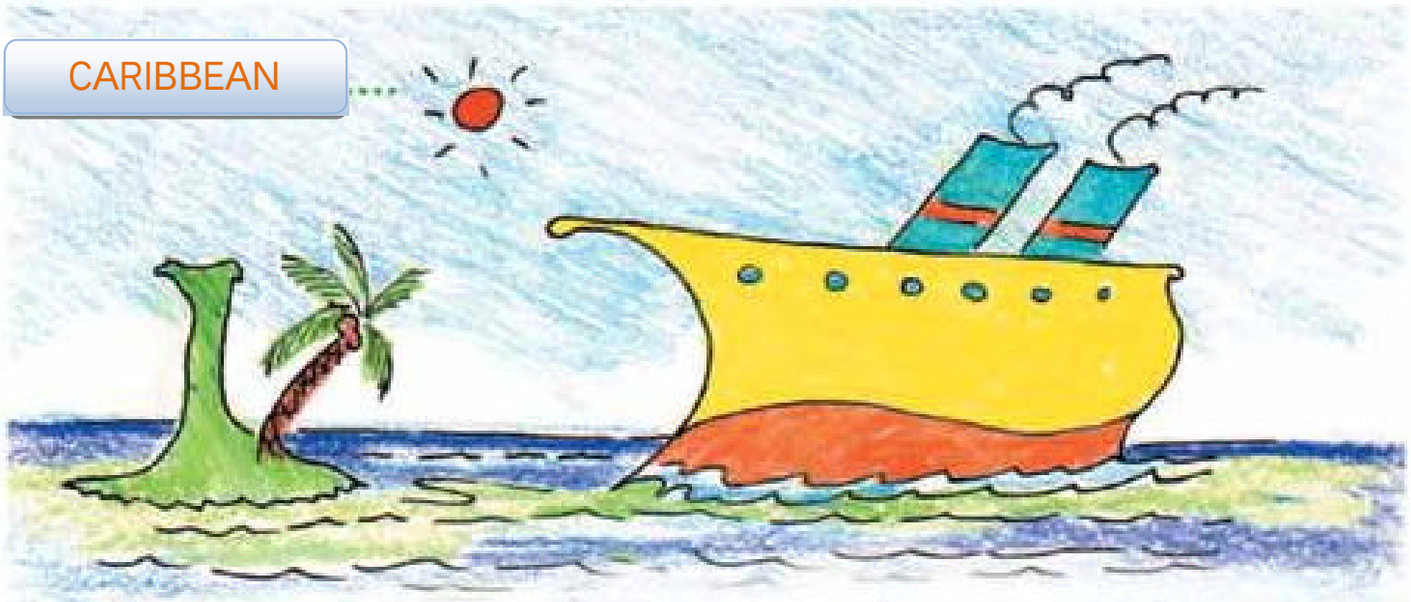
Over the calm, blue waters of the Caribbean Sea, a cruise ship is sailing towards the Caribbean Islands.

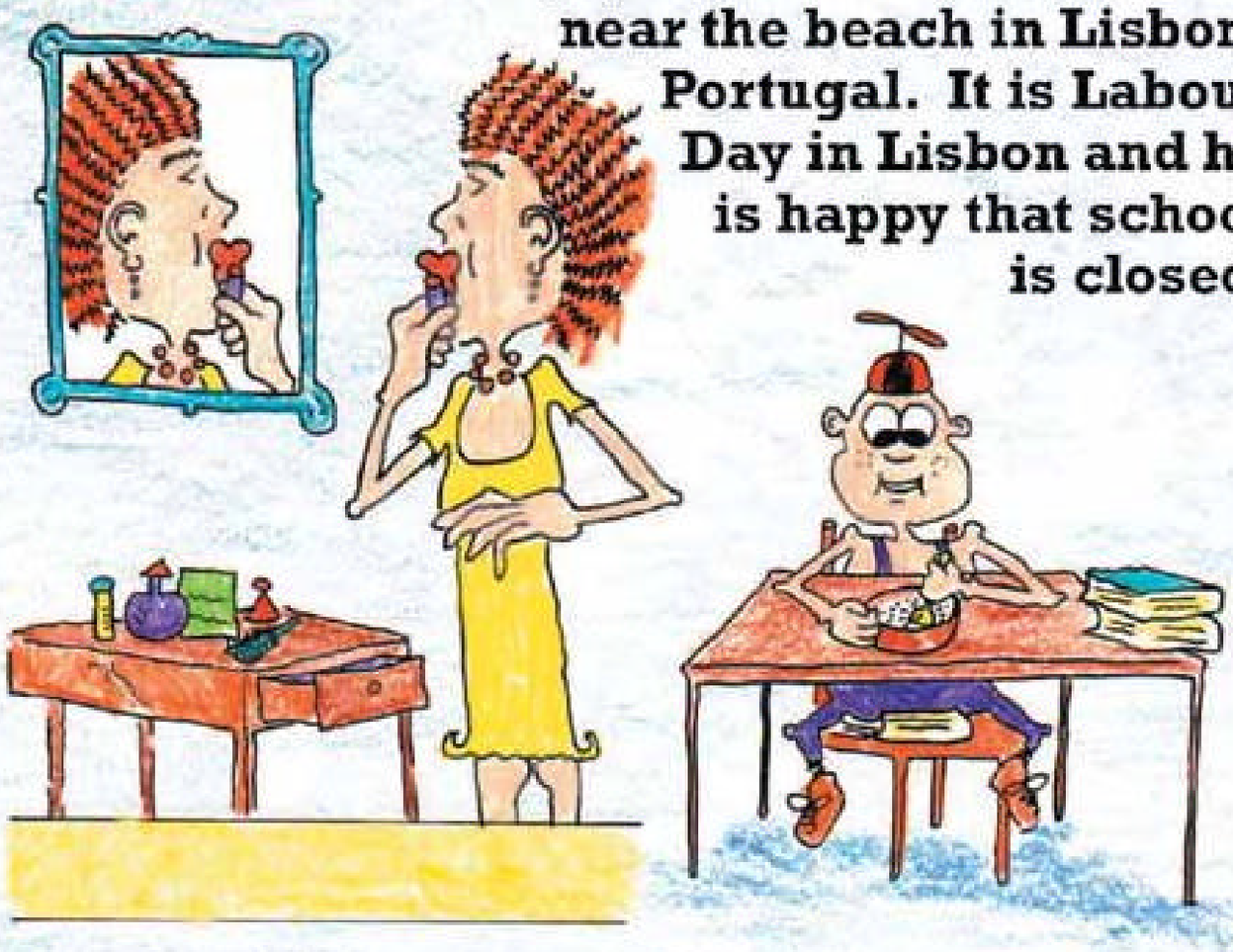
It is a warm and sunny day.

CARIBBEAN.....

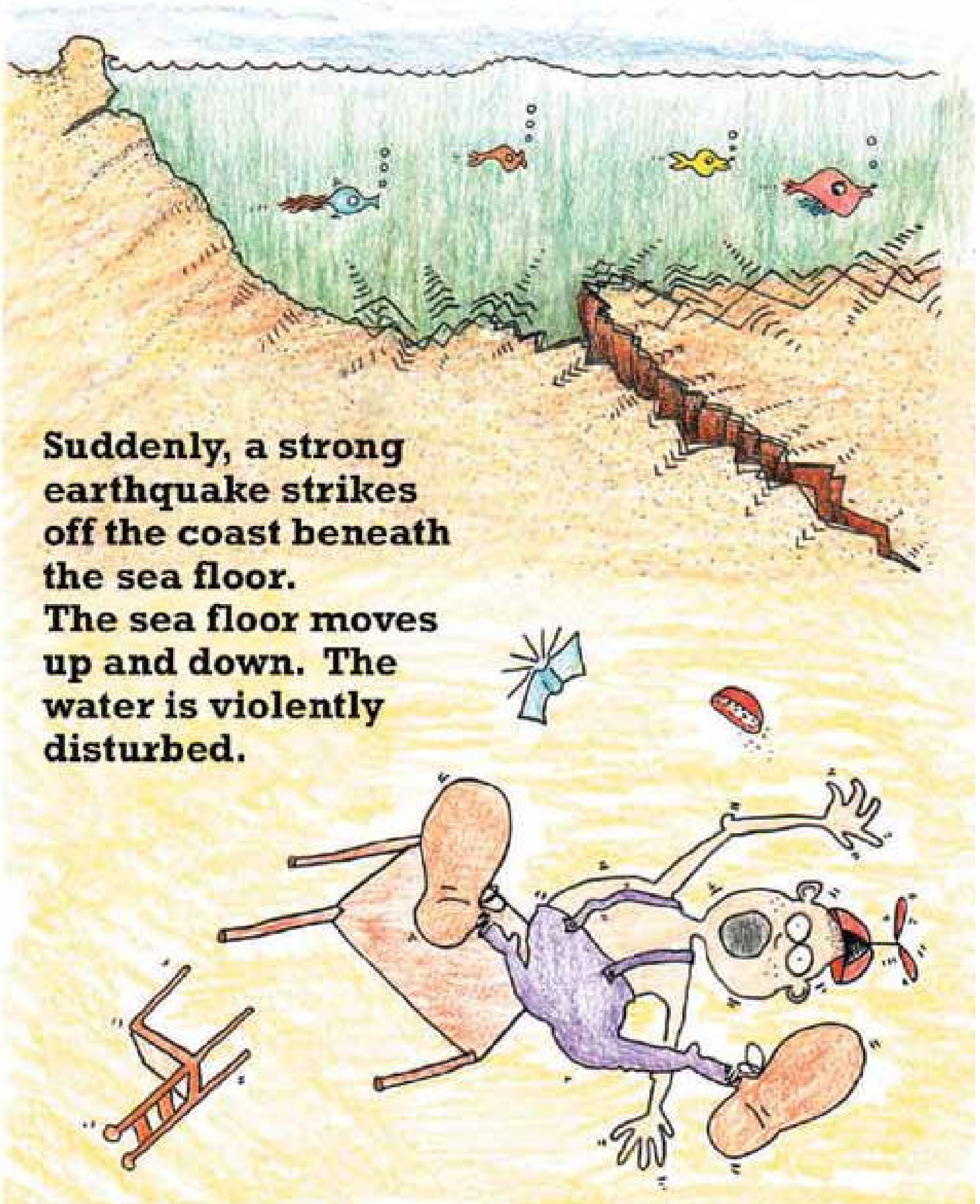


PORTUGAL.....

Thousands of miles away Angelo is enjoying his lunch. He lives near the beach in Lisbon, Portugal. It is Labour Day in Lisbon and he is happy that school is closed.



Today, Angelo and his mamãe (mummy) plan to visit his avó (granny).

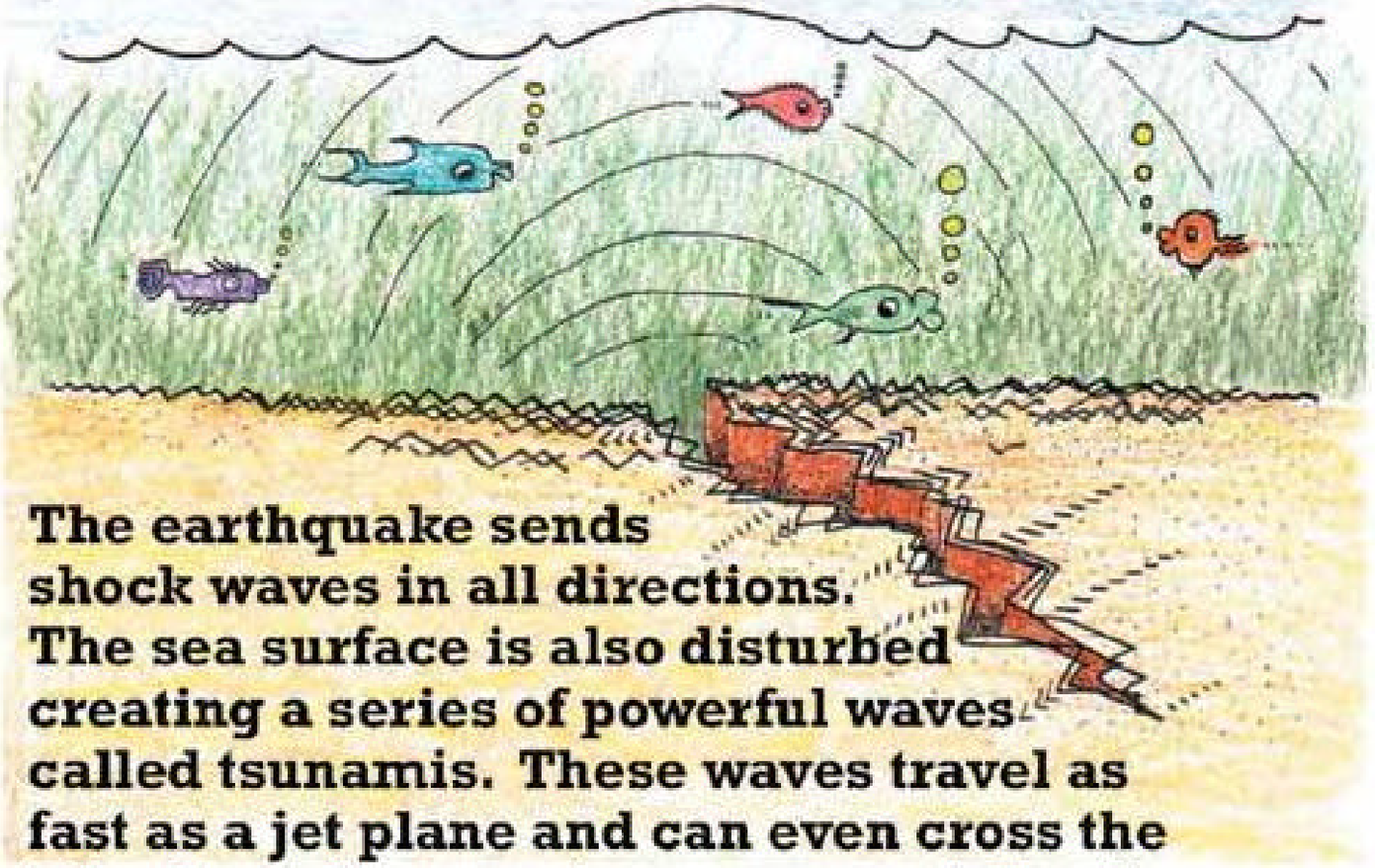


Suddenly, a strong earthquake strikes off the coast beneath the sea floor. The sea floor moves up and down. The water is violently disturbed.

The walls and floors of Angelo's house suddenly start to shake. Chairs topple over. Things rattle and break. Dishes crash to the floor.

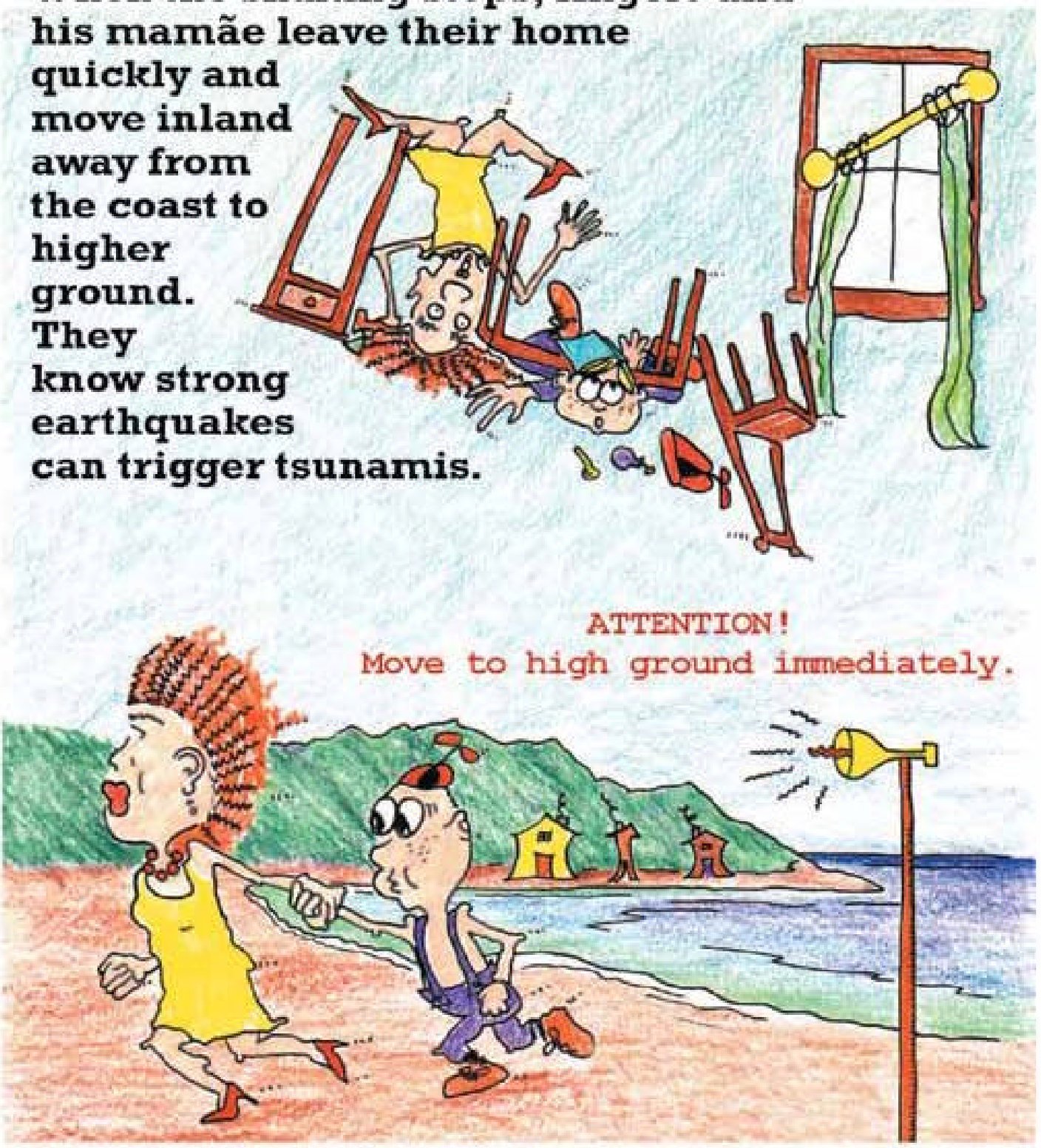
It is an earthquake! Angelo and his mamãe know what to do. They do not run outside.

Angelo takes cover under the table while his mamãe stands in the doorway.



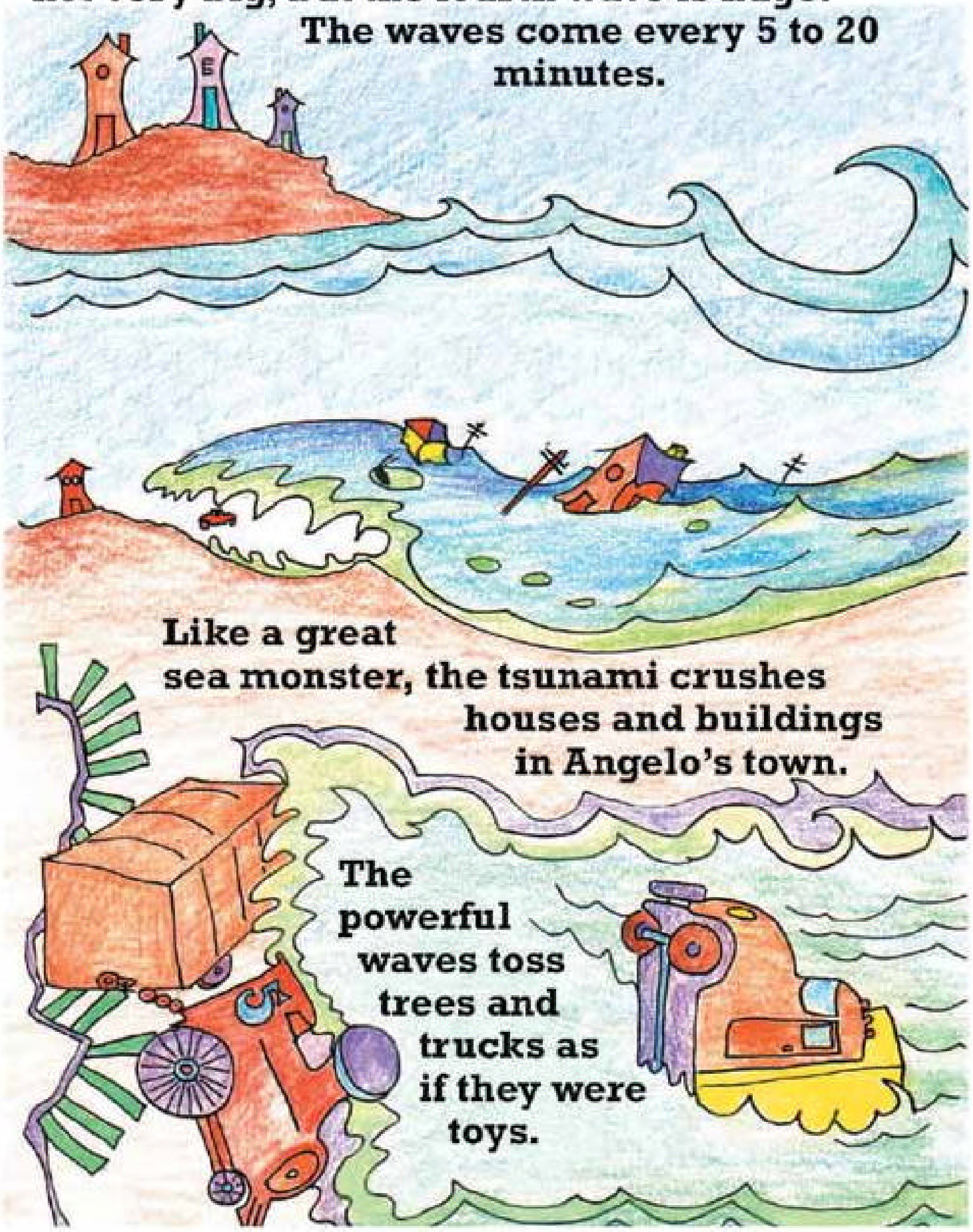
The earthquake sends shock waves in all directions. The sea surface is also disturbed creating a series of powerful waves called tsunamis. These waves travel as fast as a jet plane and can even cross the Atlantic. They are dangerous and deadly.

When the shaking stops, Angelo and his mamãe leave their home quickly and move inland away from the coast to higher ground. They know strong earthquakes can trigger tsunamis.

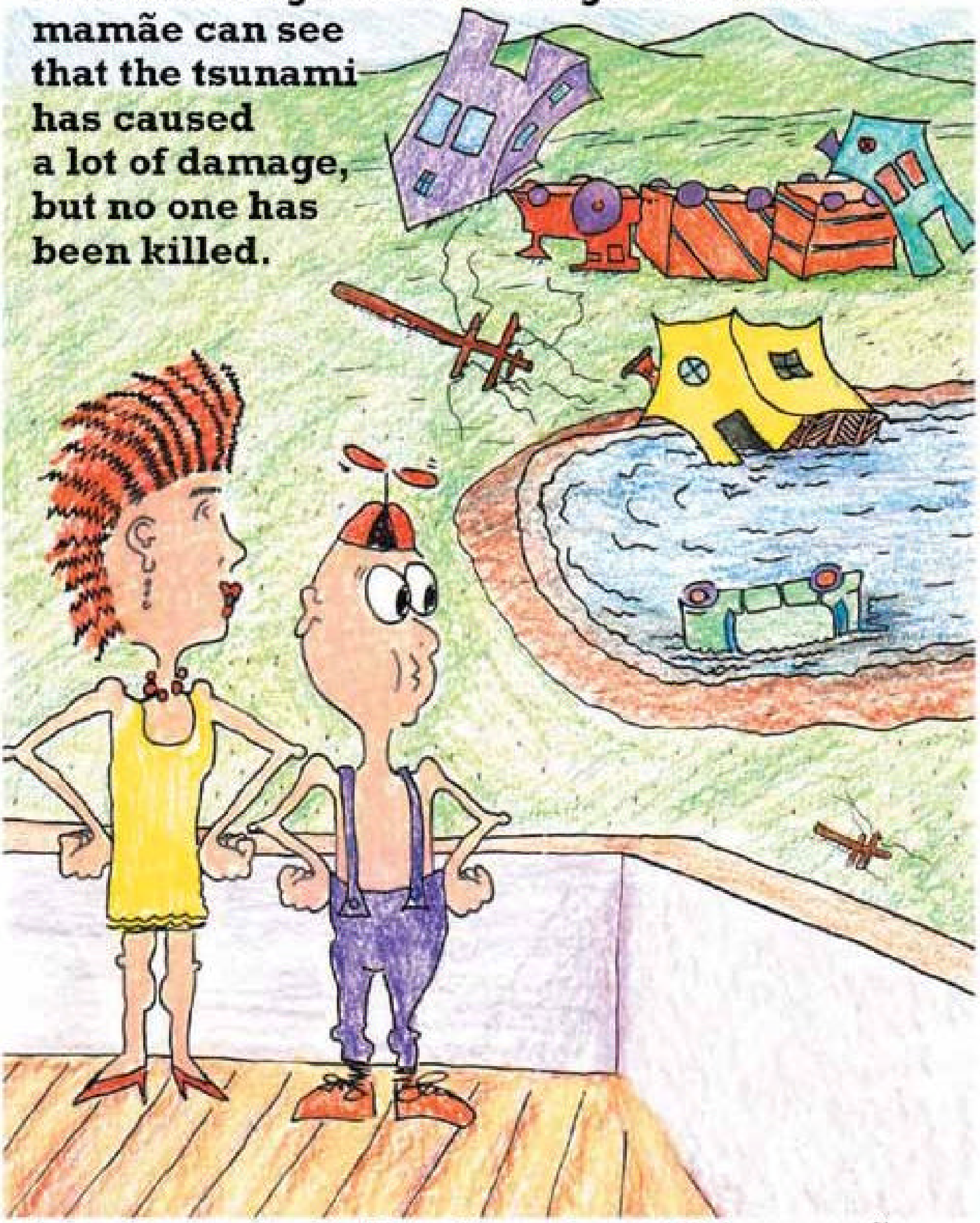


Angelo hears a tsunami warning. There is not much time. They hurry to safety, away from the shore and wait for the tsunami to come.

Minutes later the waves of the tsunami start approaching the coast. The first few waves are not very big, but the fourth wave is huge!



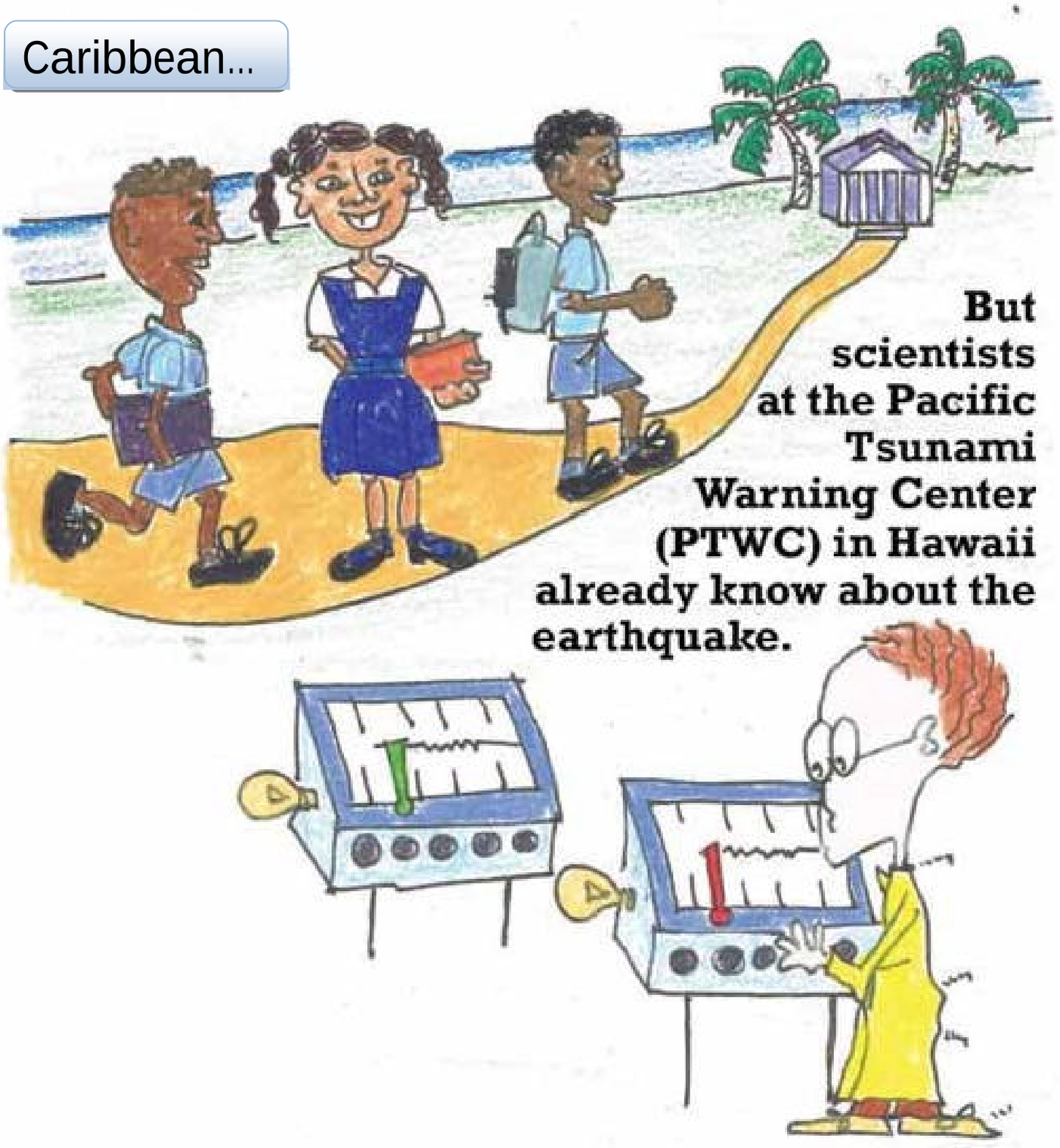
The waves keep coming but they grow smaller until the danger is over. Angelo and his mamãe can see that the tsunami has caused a lot of damage, but no one has been killed.



Everyone, including Angelo and his mamãe, left the danger zone and rushed to safety on higher ground. They evacuated the area and were saved.

Meanwhile, a cross the Atlantic in the Caribbean, Donna and her brothers have finished breakfast and they are on their way to school. They have not yet heard about the earthquake or tsunami in Lisbon.

Caribbean...



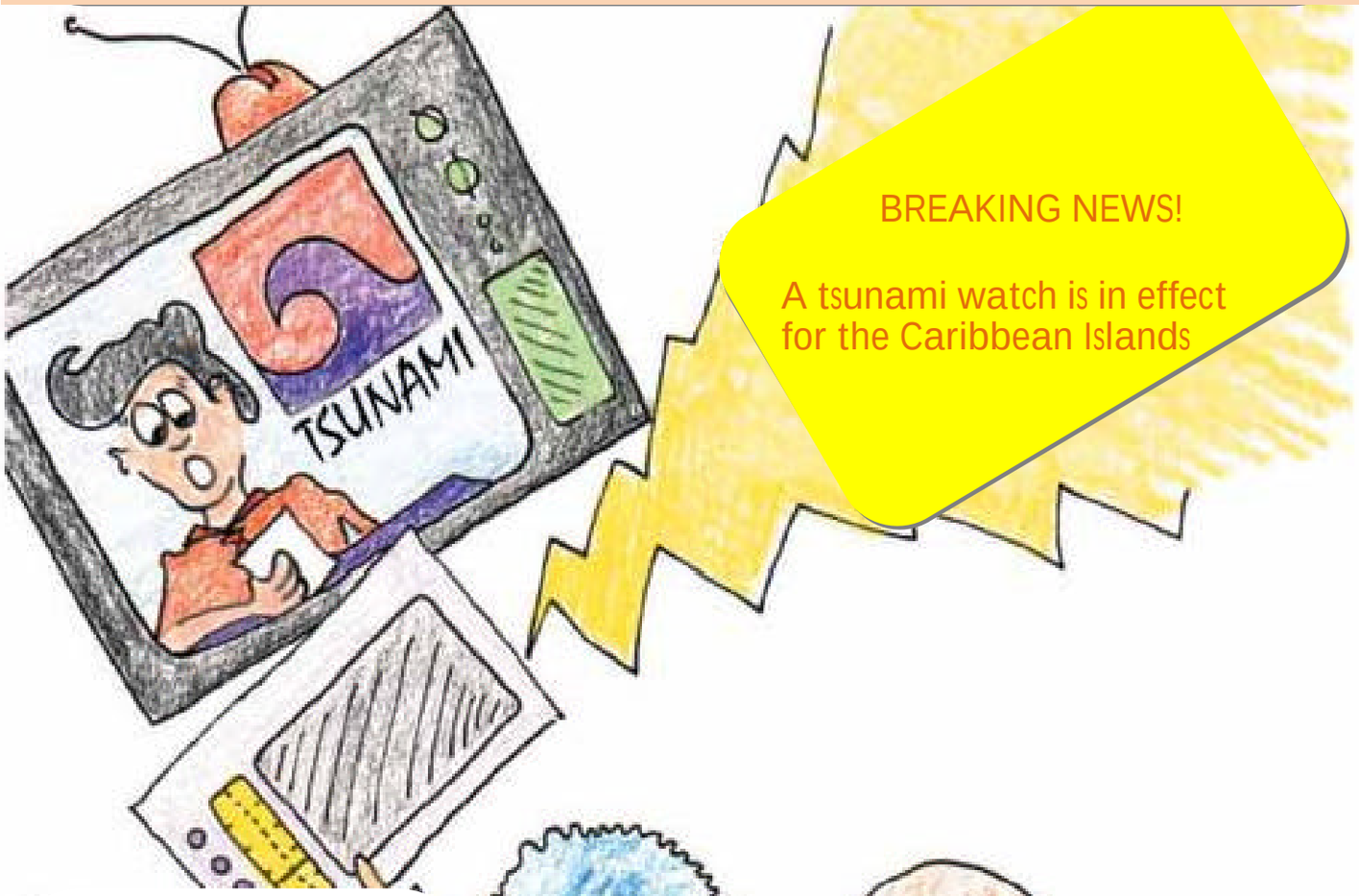
PACIFIC TSUNAMI WARNING CENTER (PTWC), Hawaii.....

The scientists at the Center work all day and all night in shifts. There is always someone on duty checking for earthquakes and sea level changes.

Quickly the scientists send messages to other tsunami warning centers in many countries all around the Atlantic.

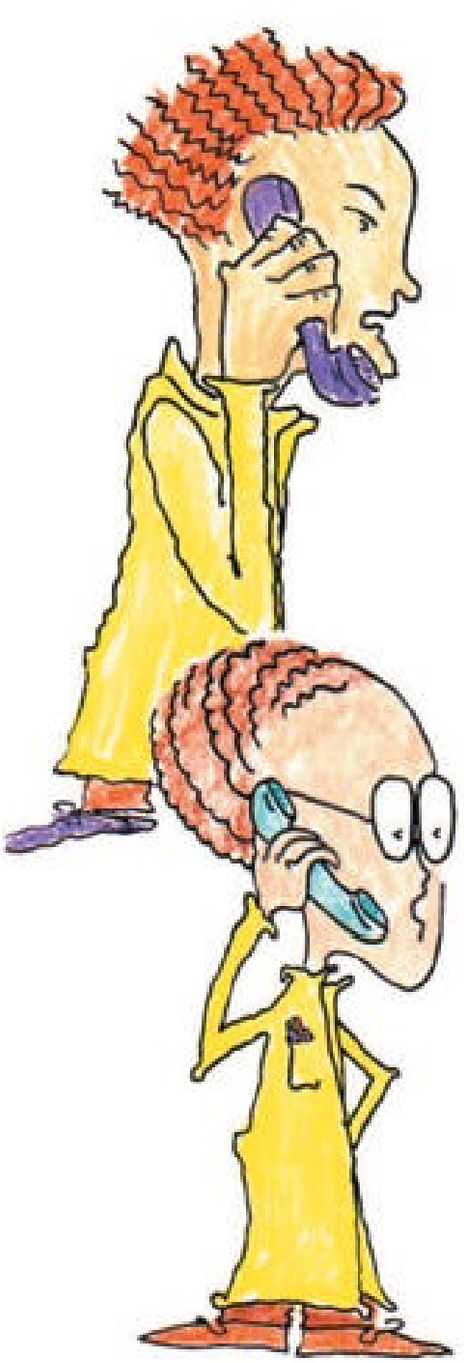
They tell them that the Portuguese earthquake was big and a tsunami is now crossing the Atlantic Ocean in all directions.

The Scientists at the PTWC in Hawaii issue a **Tsunami Watch** to all the Tsunami Warning Focal Points (TWFP) in each Caribbean Island. These Focal Points then send the message to the National Disaster Office and they use the radio and television to tell everyone to prepare because a tsunami may be on its way.



Now everyone knows about the Portugal earthquake and tsunami. Even Donna's parents know that a tsunami may be on its way.

During the Tsunami Watch, the scientists at the Pacific Tsunami Warning Center

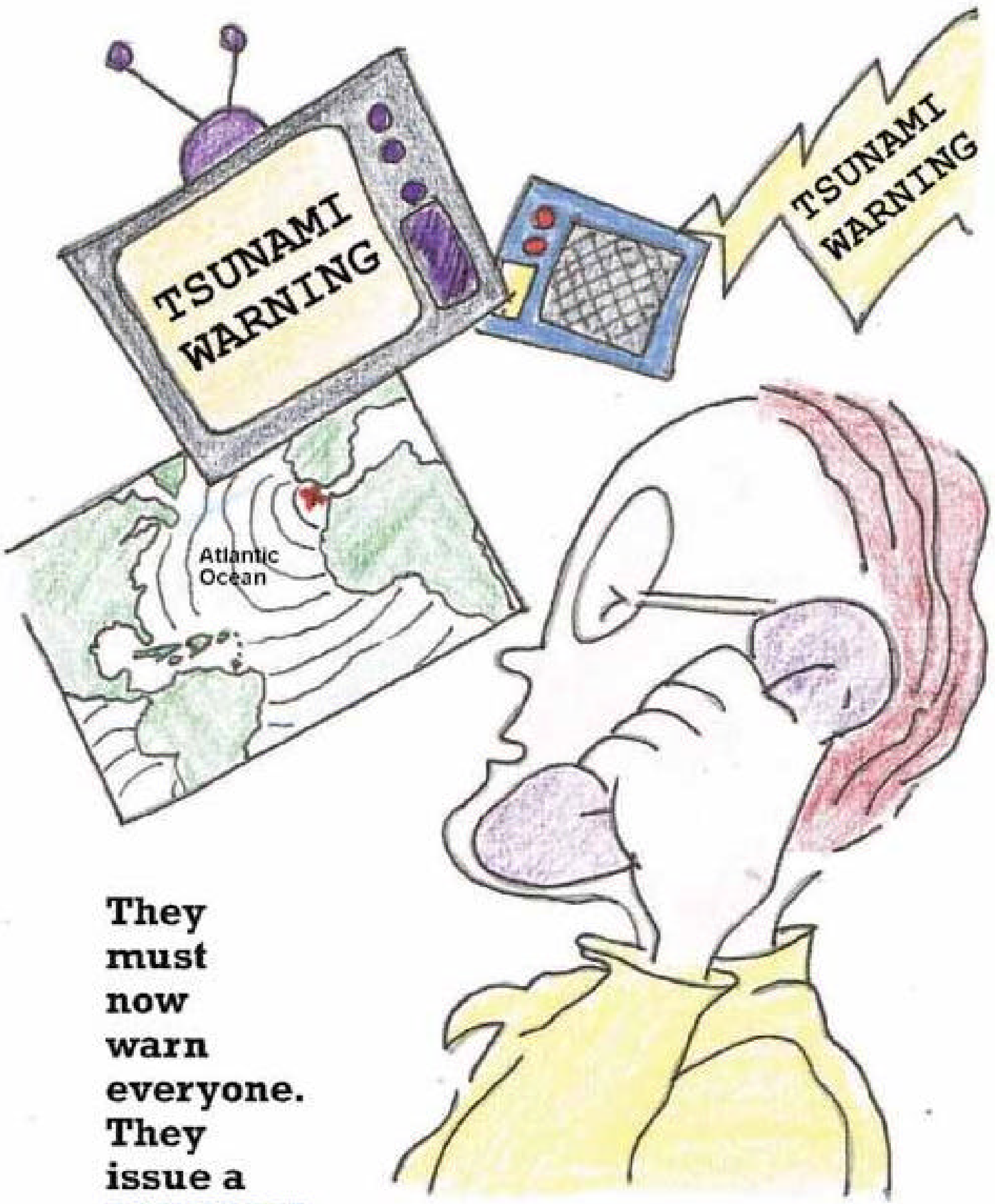


are in contact by telephone with scientists all over the Atlantic trying to assess the size of the tsunami.

They send messages by satellite, e-mail, and fax.

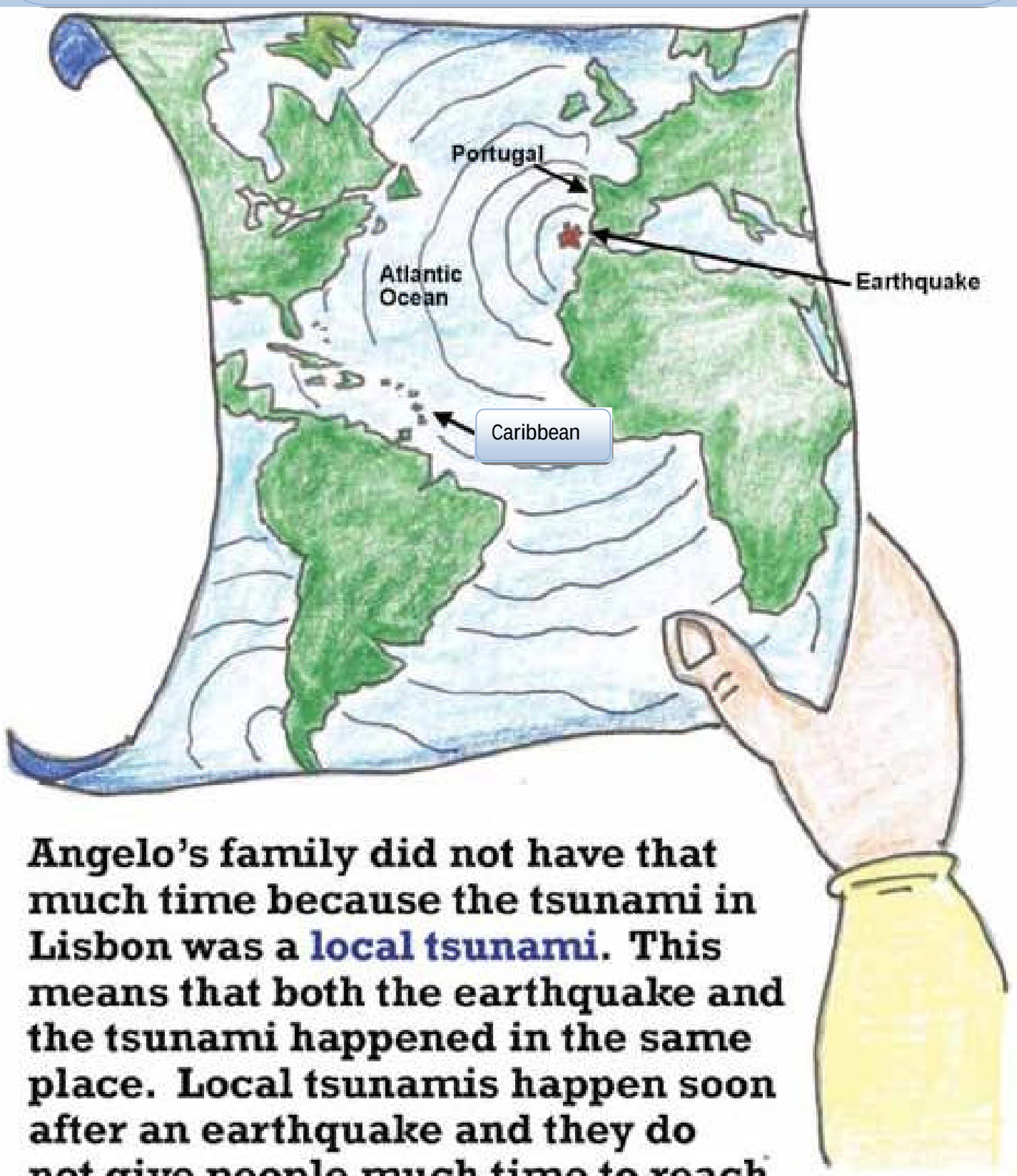
They ask for information about the height of the sea level. They check their instruments to see if a big tsunami has been recorded, and if the sea levels are rising or falling. They want to know if tsunami waves are seen in other places around the Atlantic Ocean like England, United States, Canada, or Africa.

By now the scientists have a lot of information. They confirm that a tsunami is travelling across the Atlantic.



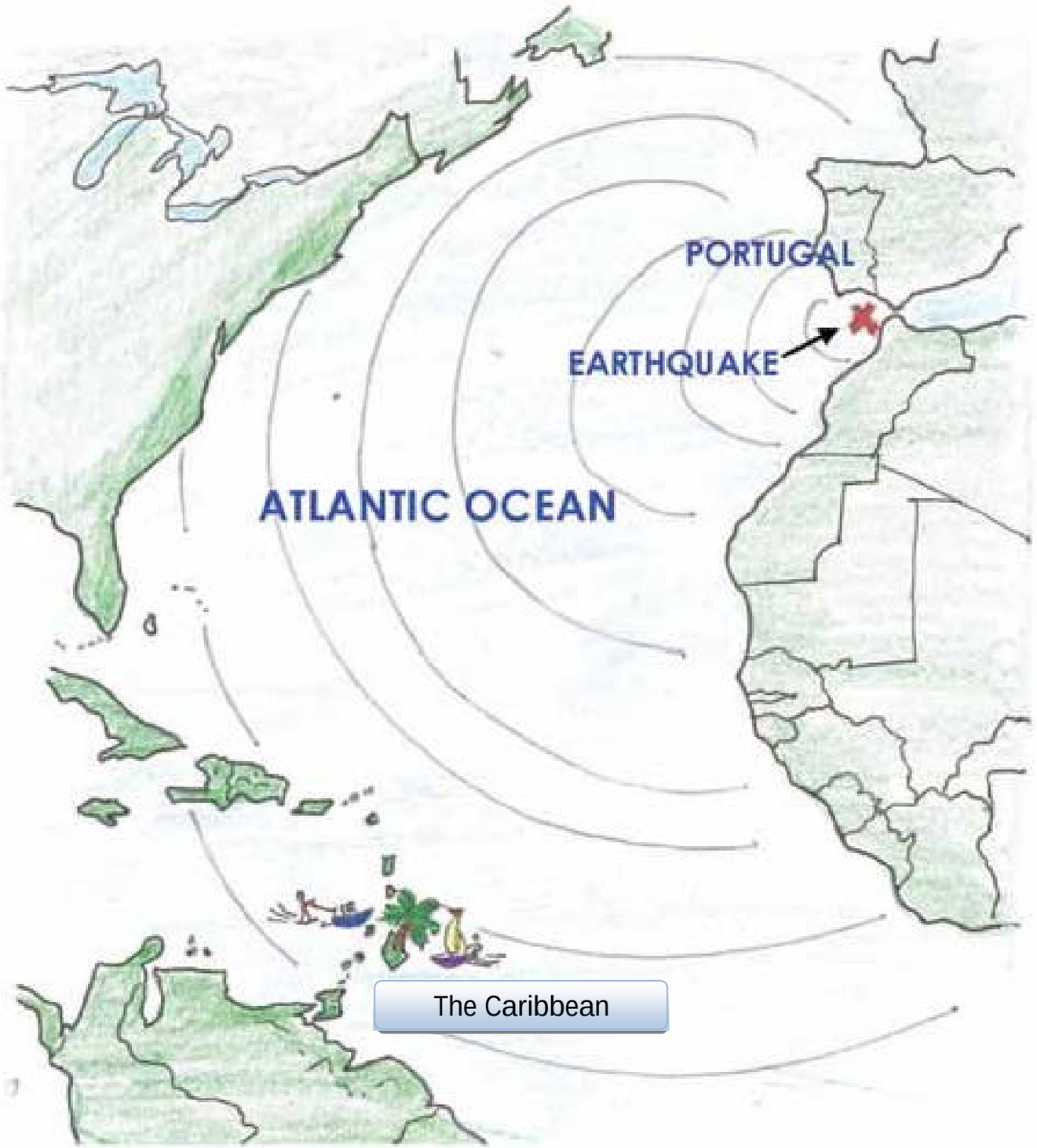
They must now warn everyone. They issue a TSUNAMI WARNING.

The tsunami crossing the Atlantic from Angelo's home in Portugal is a distant one and is sometimes called a "tele-tsunami". It will give the people of the Caribbean, like Donna's family at least six hours after the earthquake in Portugal to go to higher ground and seek shelter.

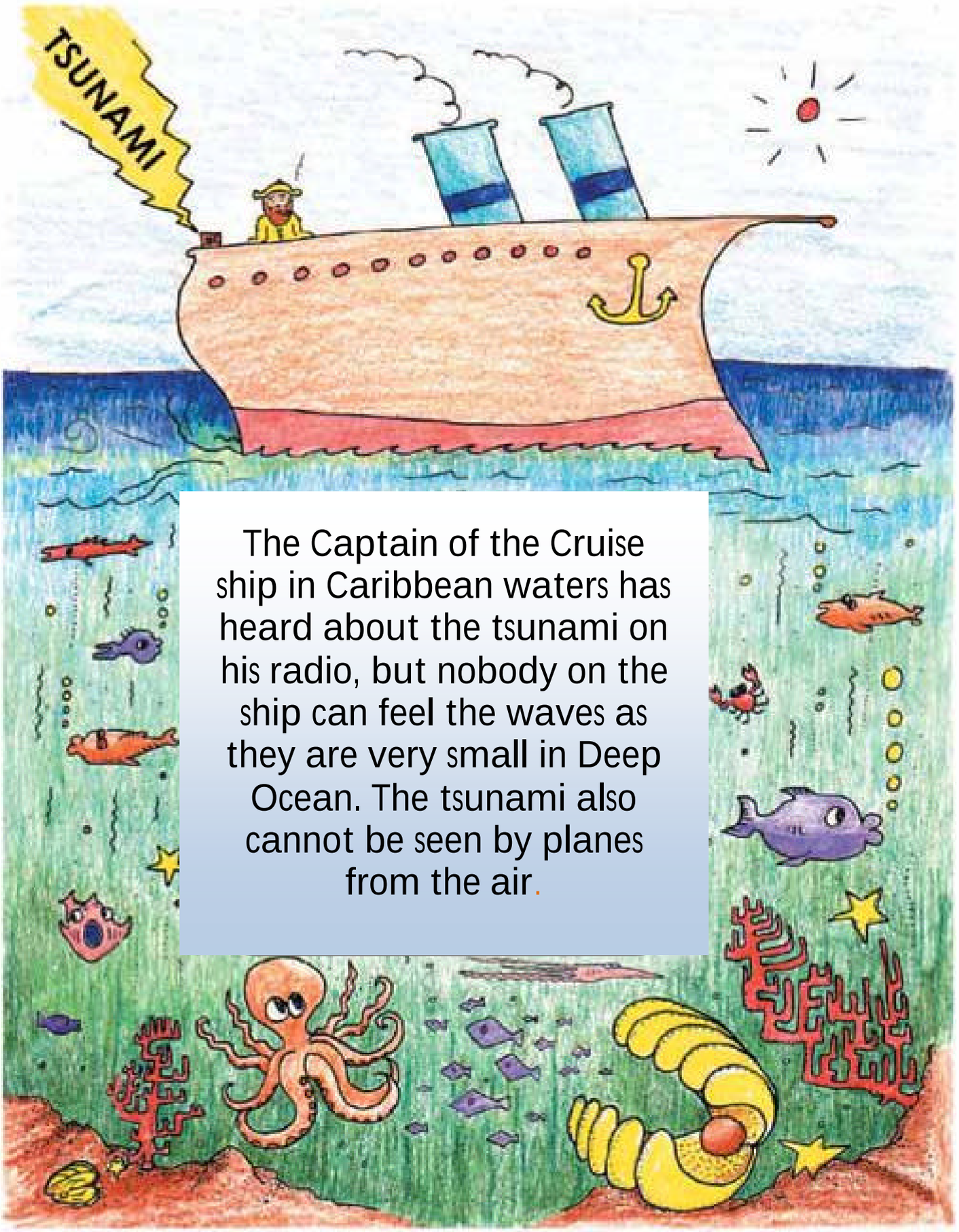


Angelo's family did not have that much time because the tsunami in Lisbon was a local tsunami. This means that both the earthquake and the tsunami happened in the same place. Local tsunamis happen soon after an earthquake and they do not give people much time to reach safety.

The tsunami has a set of very long waves that can keep hitting the shore for hours.

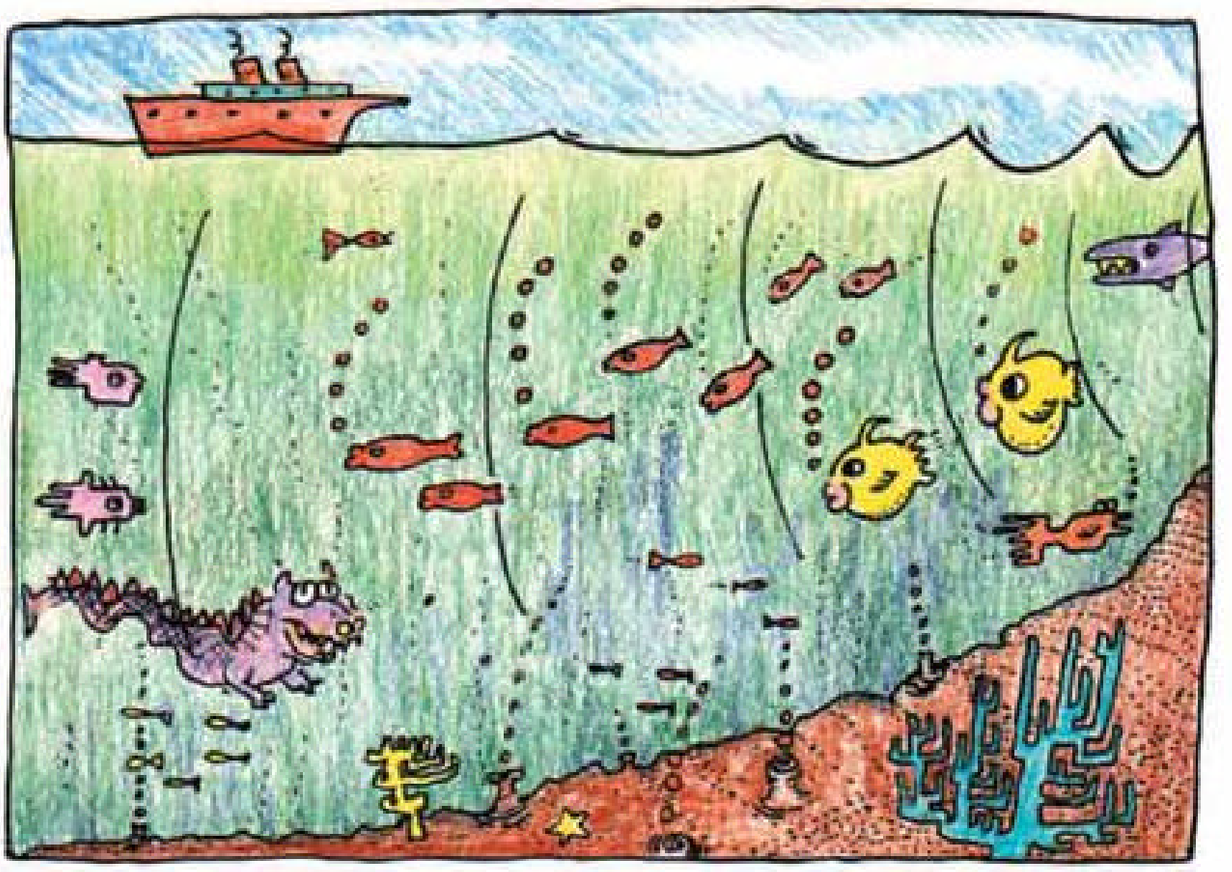


In very deep water, the waves travel as fast as a jet plane, about 800km/hr.

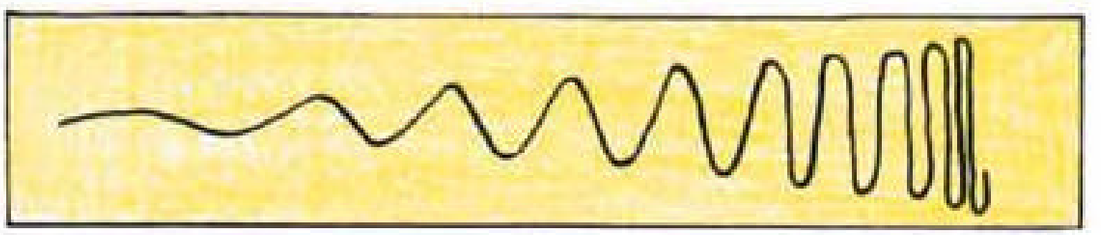


The Captain of the Cruise ship in Caribbean waters has heard about the tsunami on his radio, but nobody on the ship can feel the waves as they are very small in Deep Ocean. The tsunami also cannot be seen by planes from the air.

But, as the tsunami approaches the Caribbean it becomes dangerous.

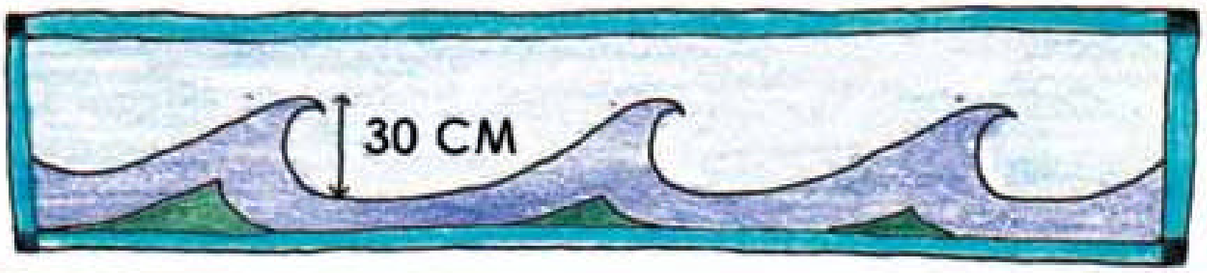


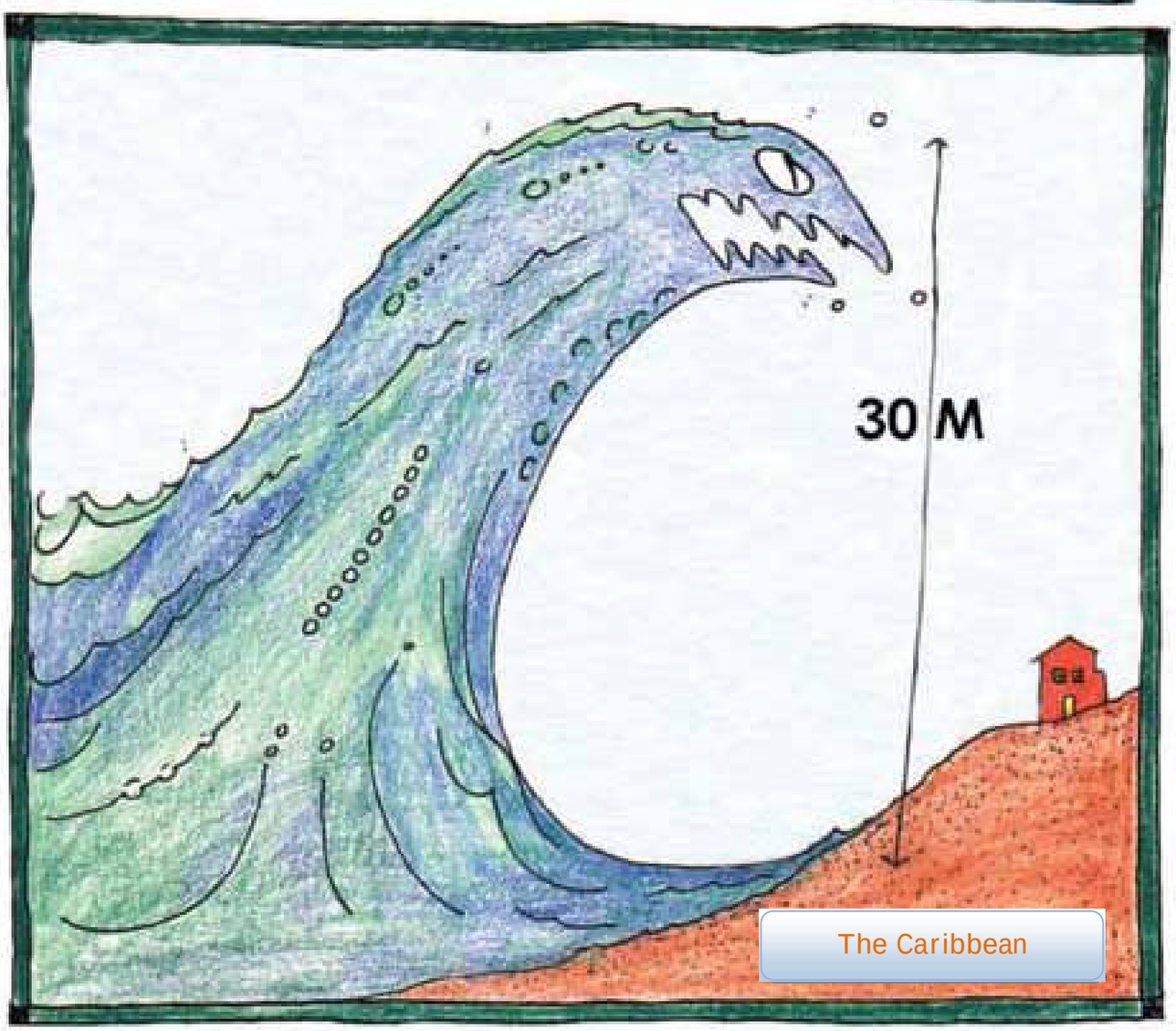
In 10 metres of water, a tsunami travels at 40 km/h. That is the speed of a slow car but it is still faster than a person can run.



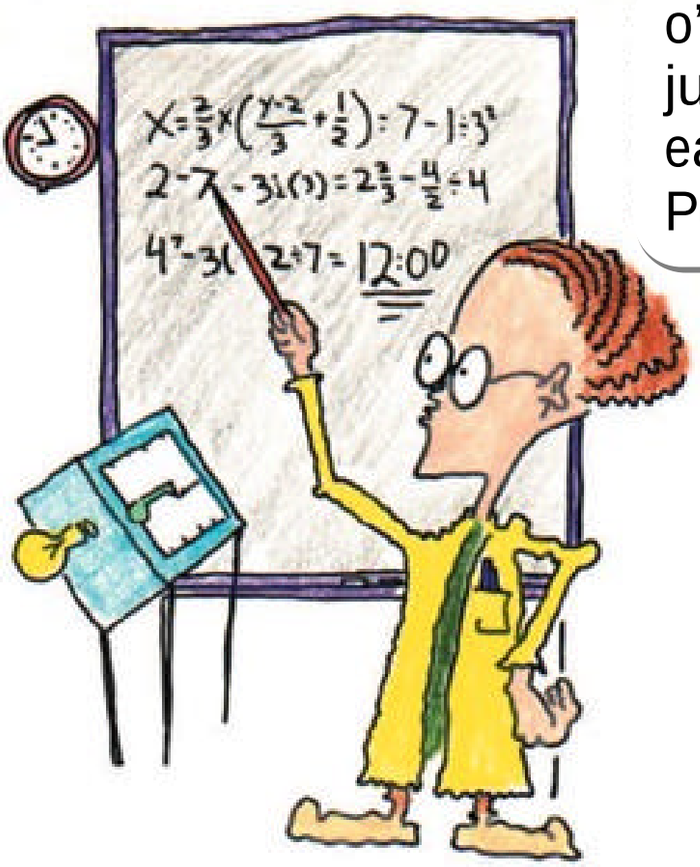
Although the first wave slows down when it enters shallow water, the second wave is 200 km away, and still traveling faster. It catches up to the first wave, slows down and joins with the waves ahead making them bunch up and grow taller. This squashing together makes the waves taller.

This is when the tsunami can become very dangerous. A small wave only 30 centimeters (cm) high in the deep ocean can grow into a 30m high monster waver as it sweeps over the shore of the various islands in the Caribbean.



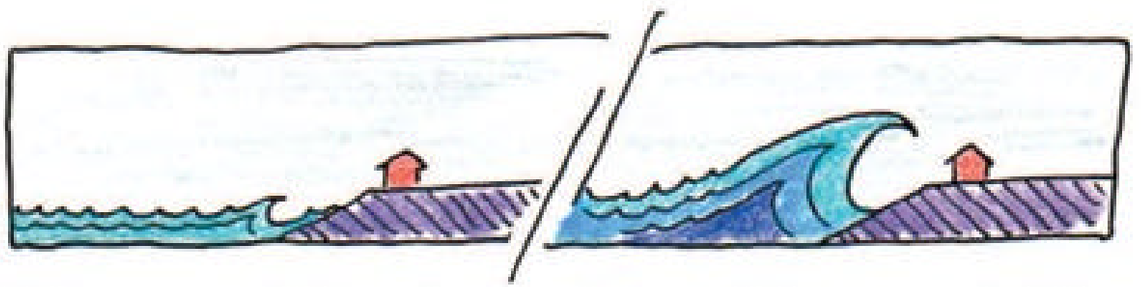


The scientists calculate that the first wave of the tsunami will reach the Caribbean islands at about 2 o'clock in the afternoon, just six hours after then earthquake took place in Portugal.

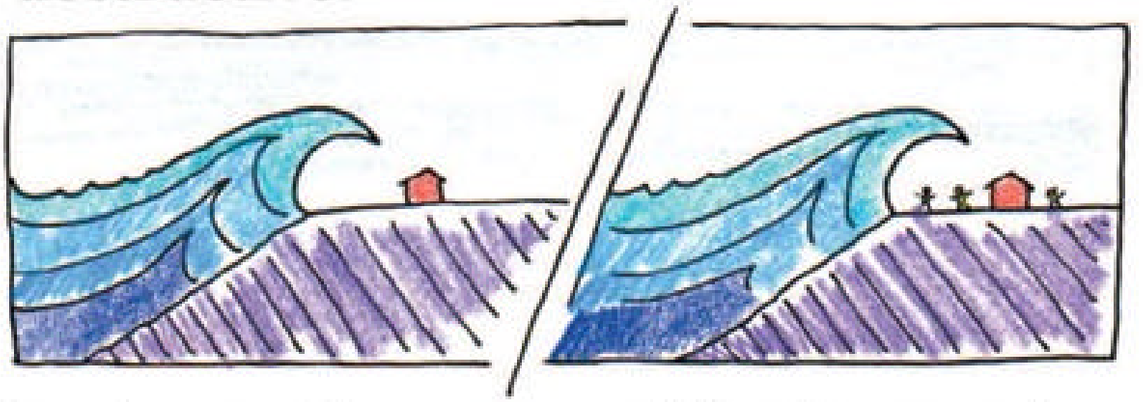


But they cannot tell how big or destructive the wave will be.

They could be small. They could be gigantic.

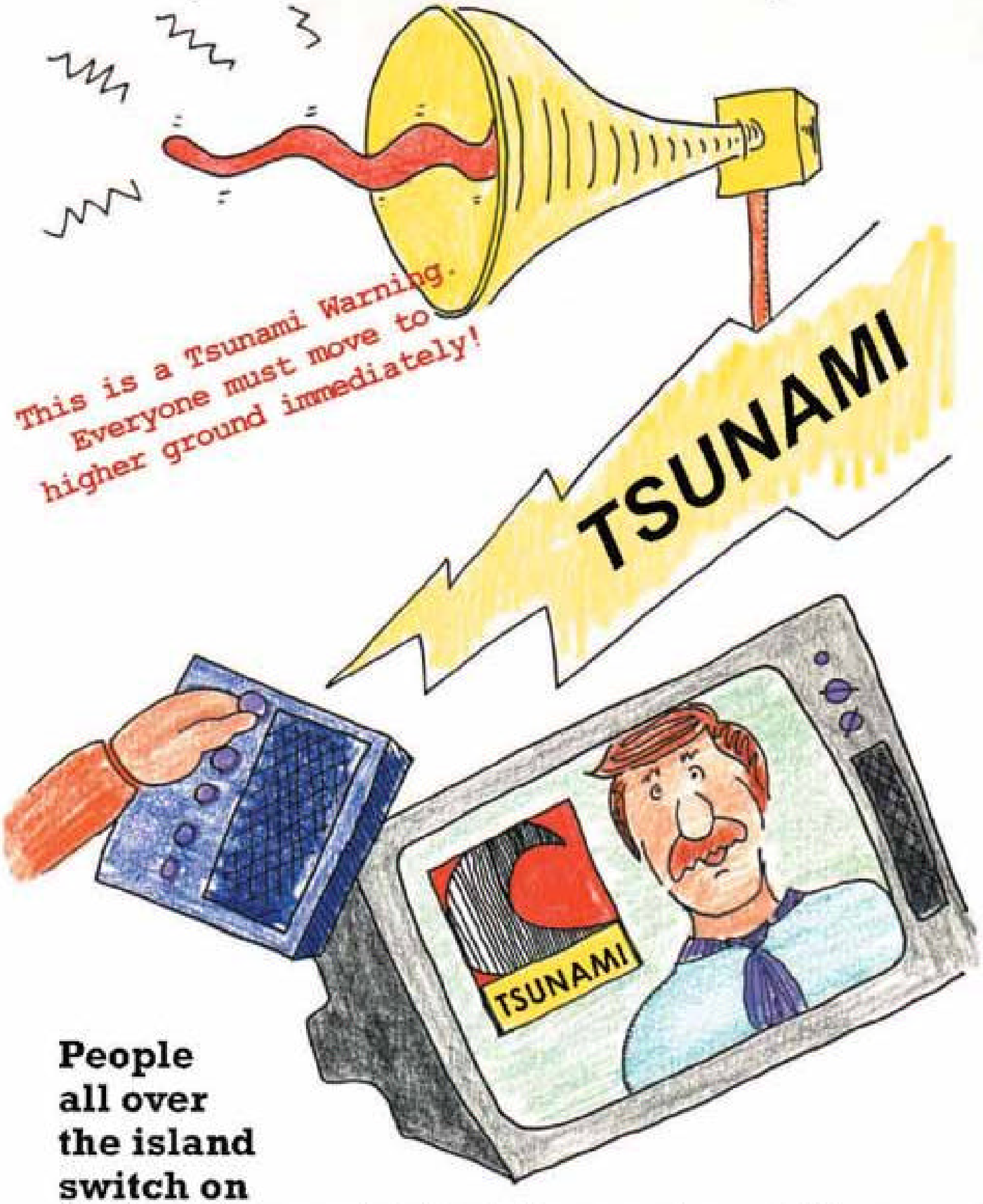


They could be harmless. They could be destructive.



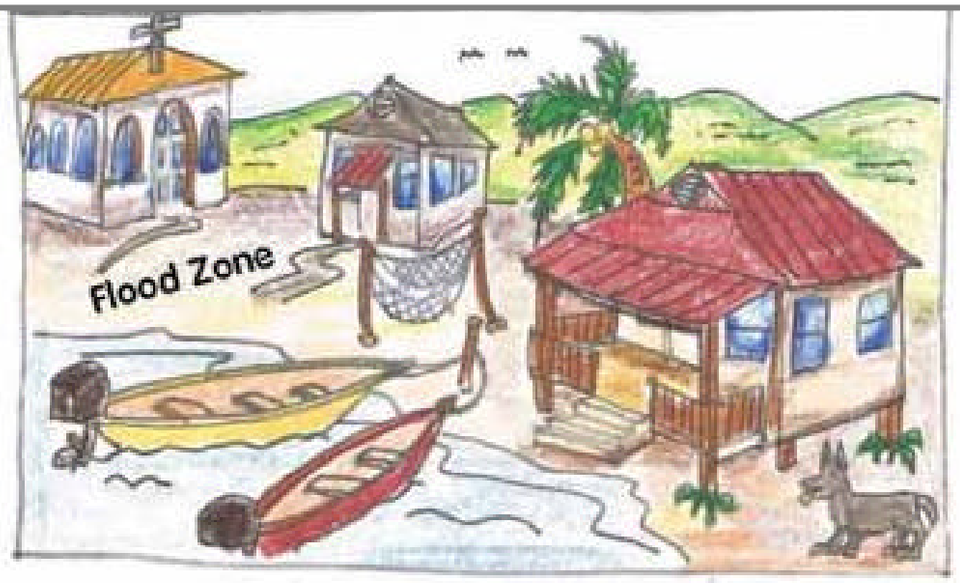
People must be prepared for the worst and hope for the best.

At 11 o'clock, three hours before the Tsunami is scheduled to arrive, the disaster management office tells everyone that a tsunami is coming.

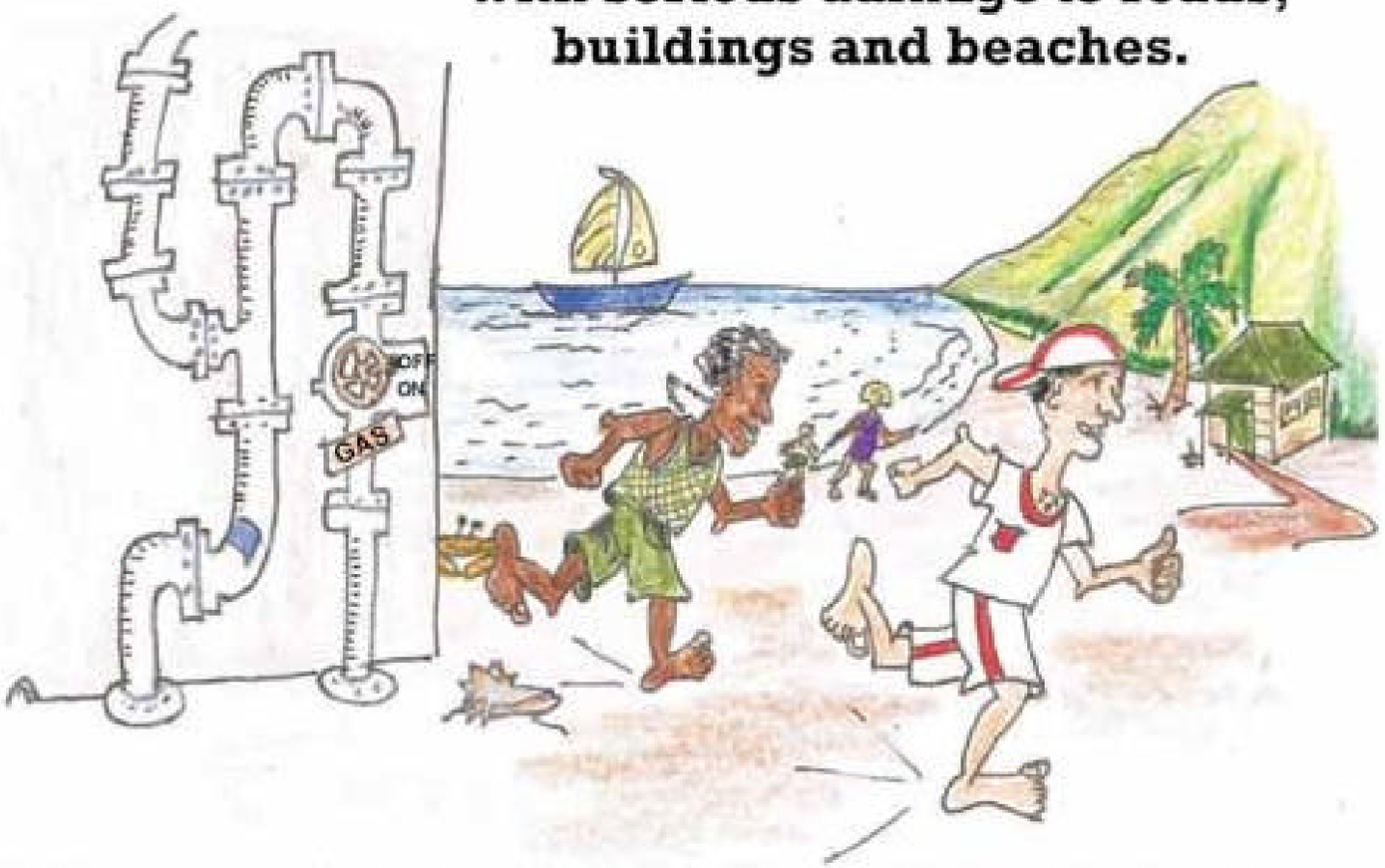


People all over the island switch on their radios and televisions and go online to get the information they need.

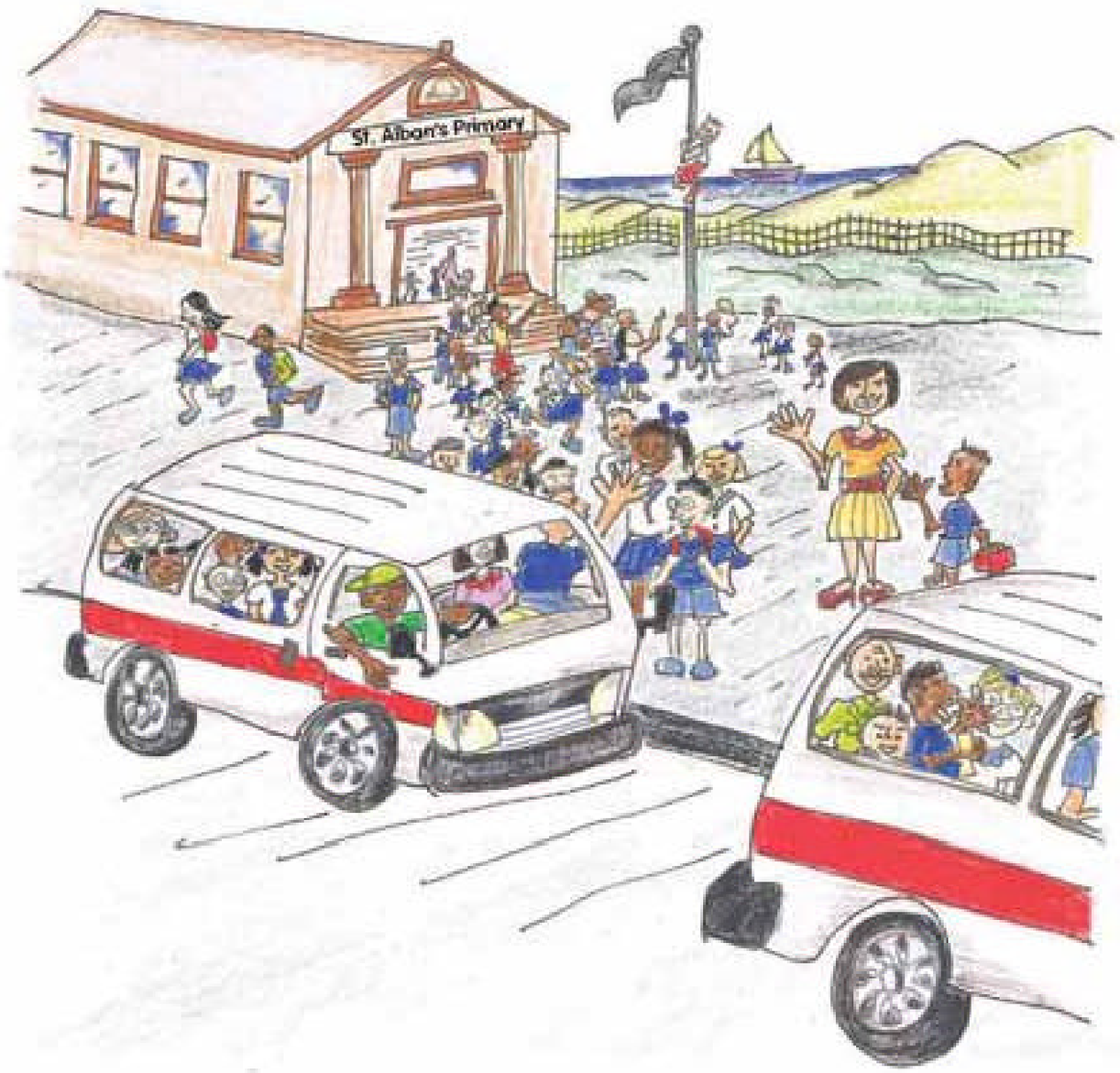
Beaches and low-lying areas along the coast of the islands are in the tsunami flood zone.



These are dangerous areas where the tsunami may hit and cause flooding or inundation with serious damage to roads, buildings and beaches.

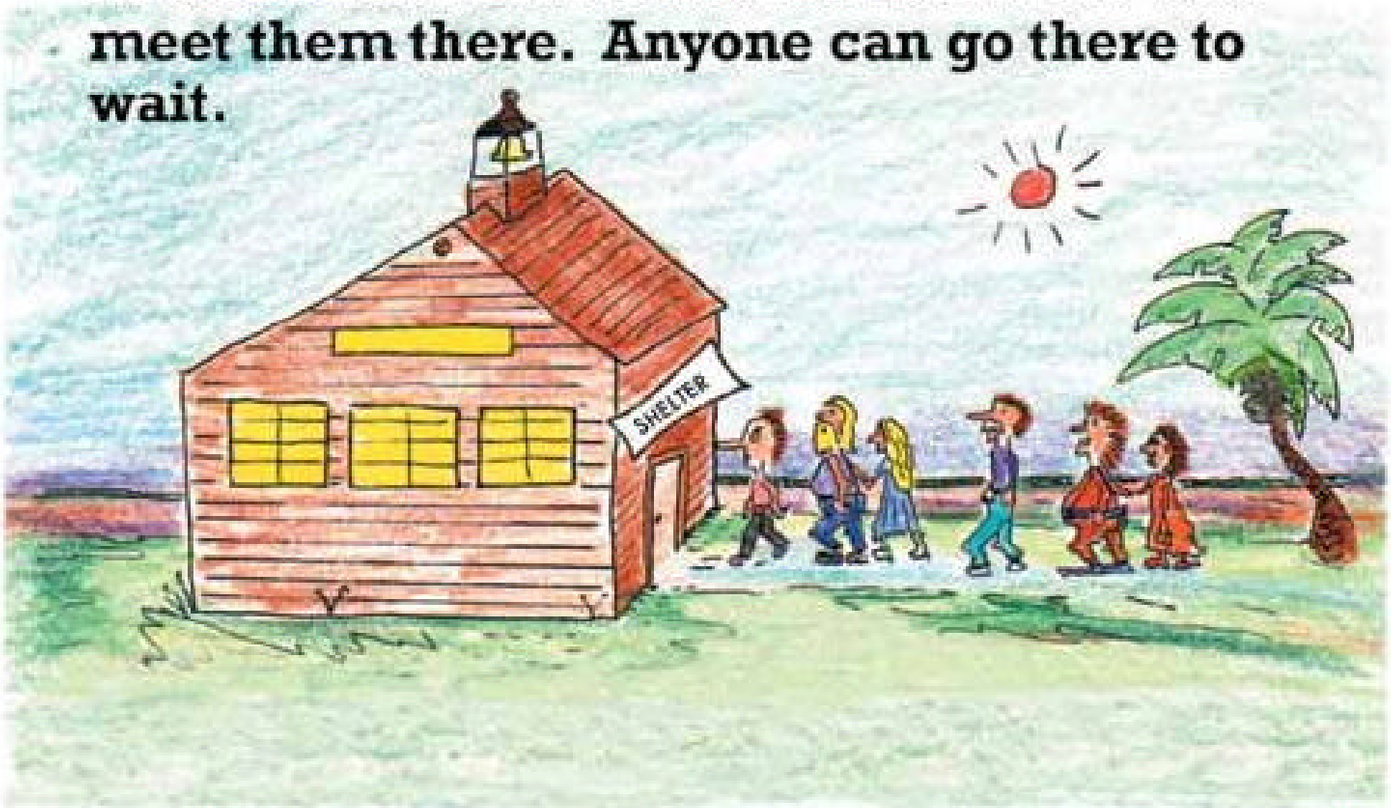


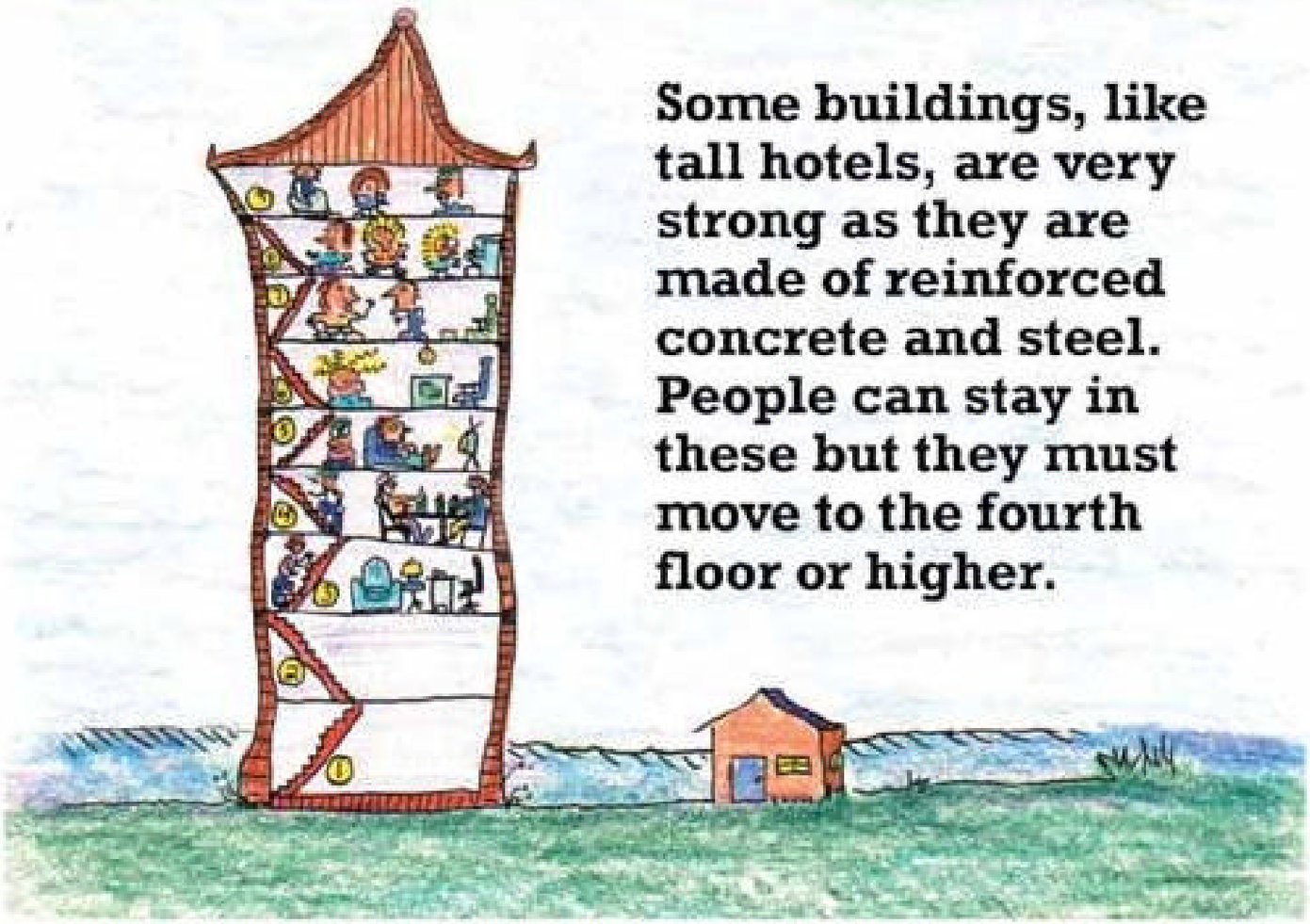
Everyone leaves the beaches. Donna's house is on the coast so her parents switch off water, electricity and gas at the main valves and head immediately inland to the safe zone. Shops and offices in coastal areas must evacuate as well.



Donna's school is also in the flood zone. Luckily, since the tsunami is coming from far away, her teacher has enough time to arrange for vehicles to move the children inland. This is very different from the response to the tsunami in Portugal where Angelo and his mamãe had to leave the beach immediately by foot because there was no time to drive.

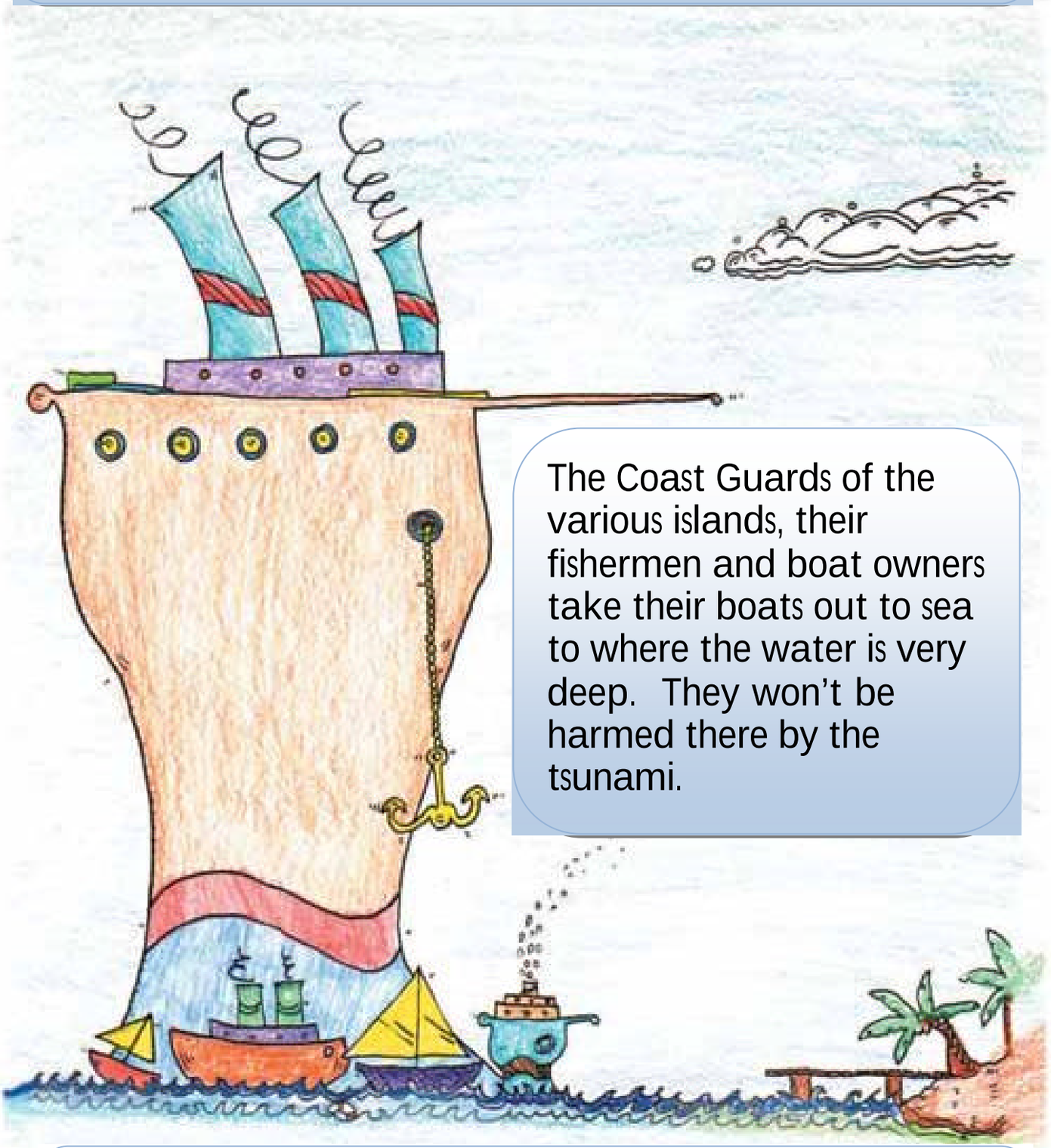
Everyone moves from the dangerous flood zones to safe areas or shelters nearby. Donna's parents go to a school on a hill nearby in the safe zone which is being used as a shelter. Donna and her brothers will meet them there. Anyone can go there to wait.





Some buildings, like tall hotels, are very strong as they are made of reinforced concrete and steel. People can stay in these but they must move to the fourth floor or higher.

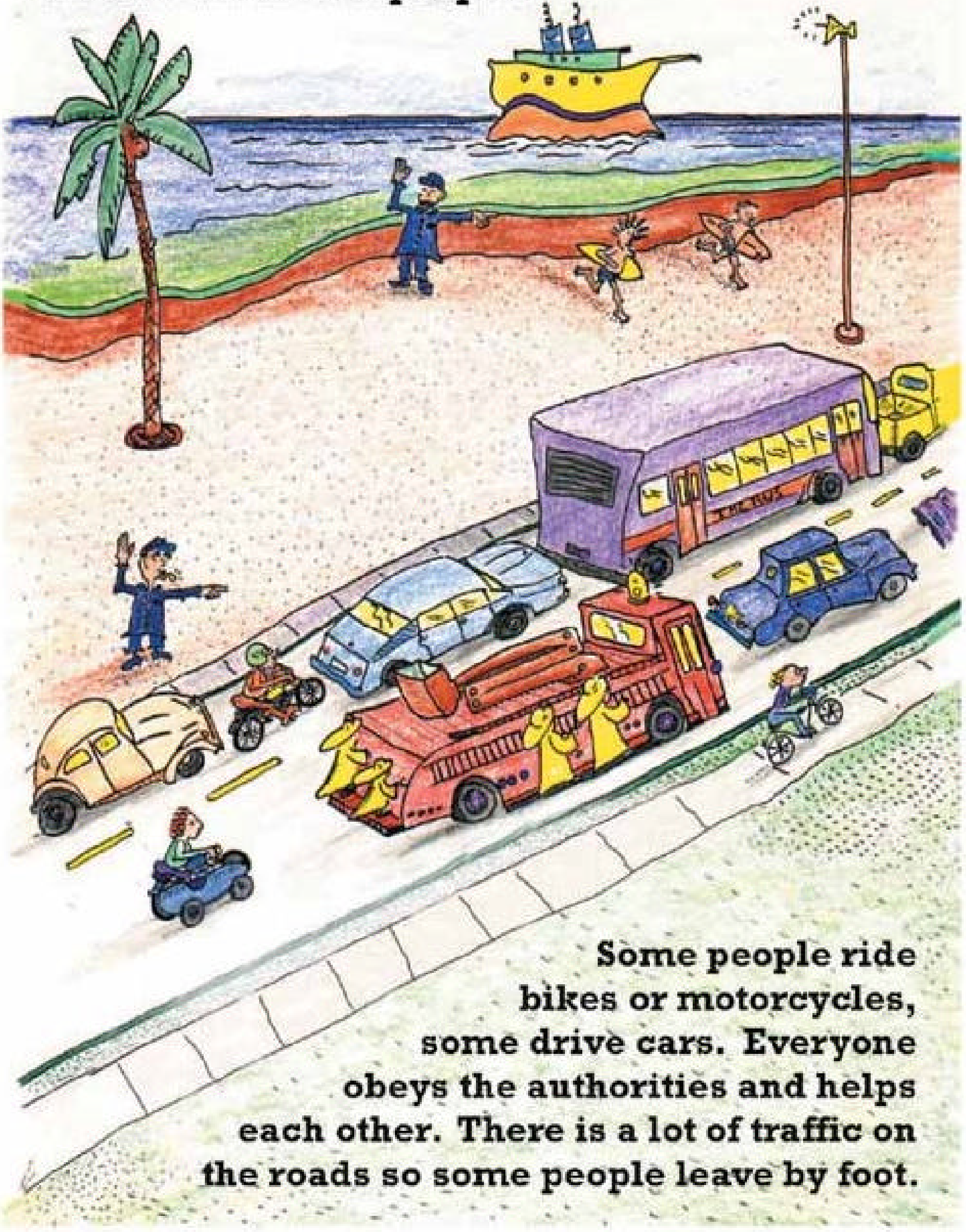
The Cruise Ship in the Caribbean does not pull into any port. It will remain out on the Ocean where it will be safe.



The Coast Guards of the various islands, their fishermen and boat owners take their boats out to sea to where the water is very deep. They won't be harmed there by the tsunami.

Boats won't return until it is safe and the National Tsunami Focal Point gives the "ALL CLEAR" signal.

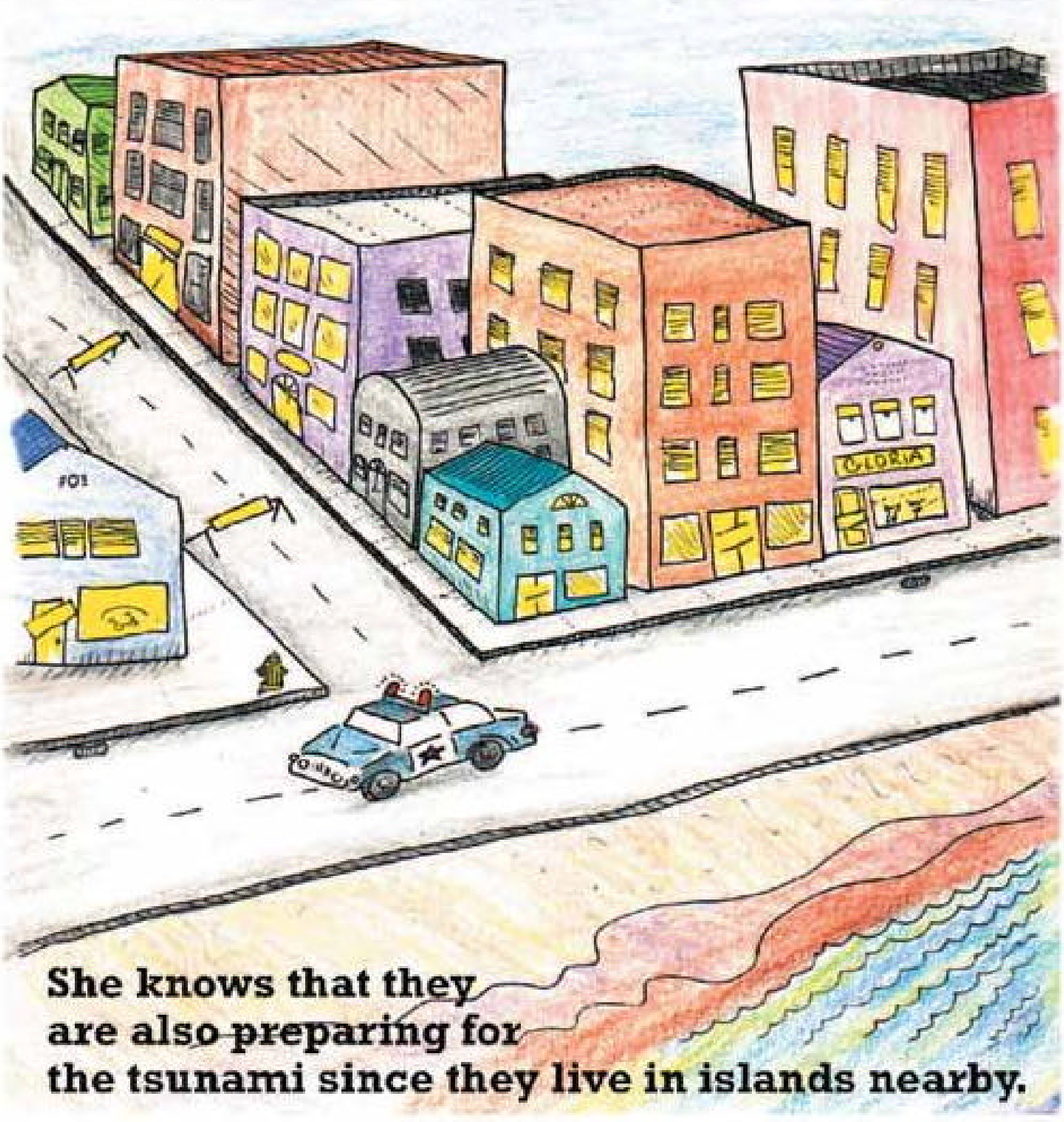
It is now 12 o'clock and the tsunami is estimated to arrive in two hours. Surfers get out of the water. They know tsunamis are not surfing waves. They are full of rocks, trees and floating debris that can kill people.



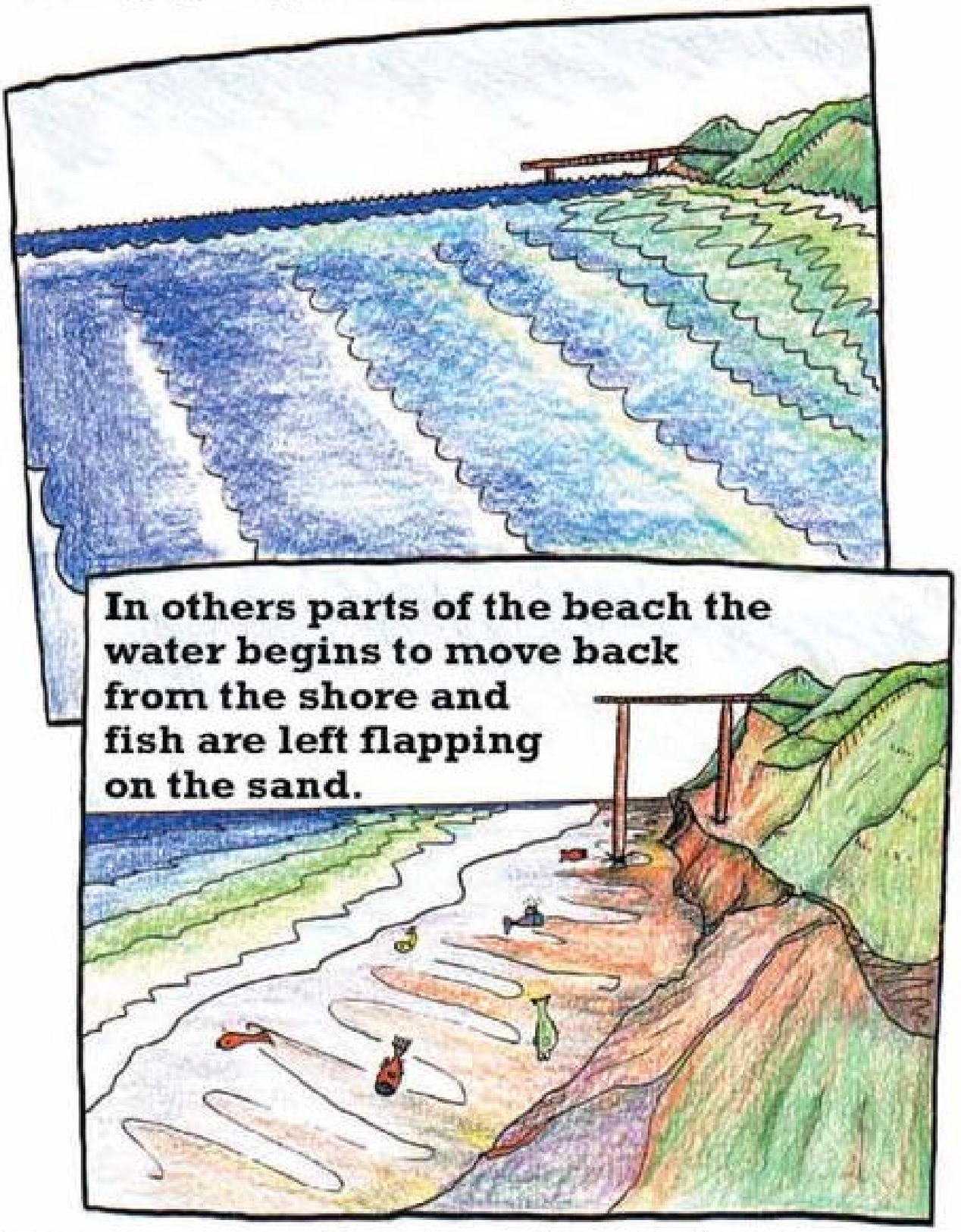
Some people ride bikes or motorcycles, some drive cars. Everyone obeys the authorities and helps each other. There is a lot of traffic on the roads so some people leave by foot.

By 1 o'clock, the police are busy checking that everyone has evacuated. They make sure no one has been left behind before blocking off the roads so no one can return to the dangerous areas.

While she waits for the tsunami to come, Donna thinks about her cousins in the other islands.

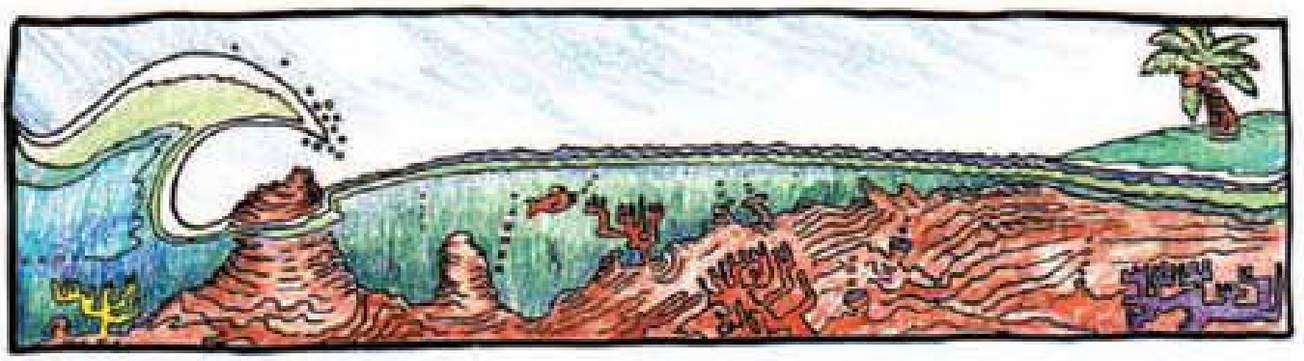


Donna can see the beach from the shelter and she notices that in some places the sea is rising gently. This is very strange.

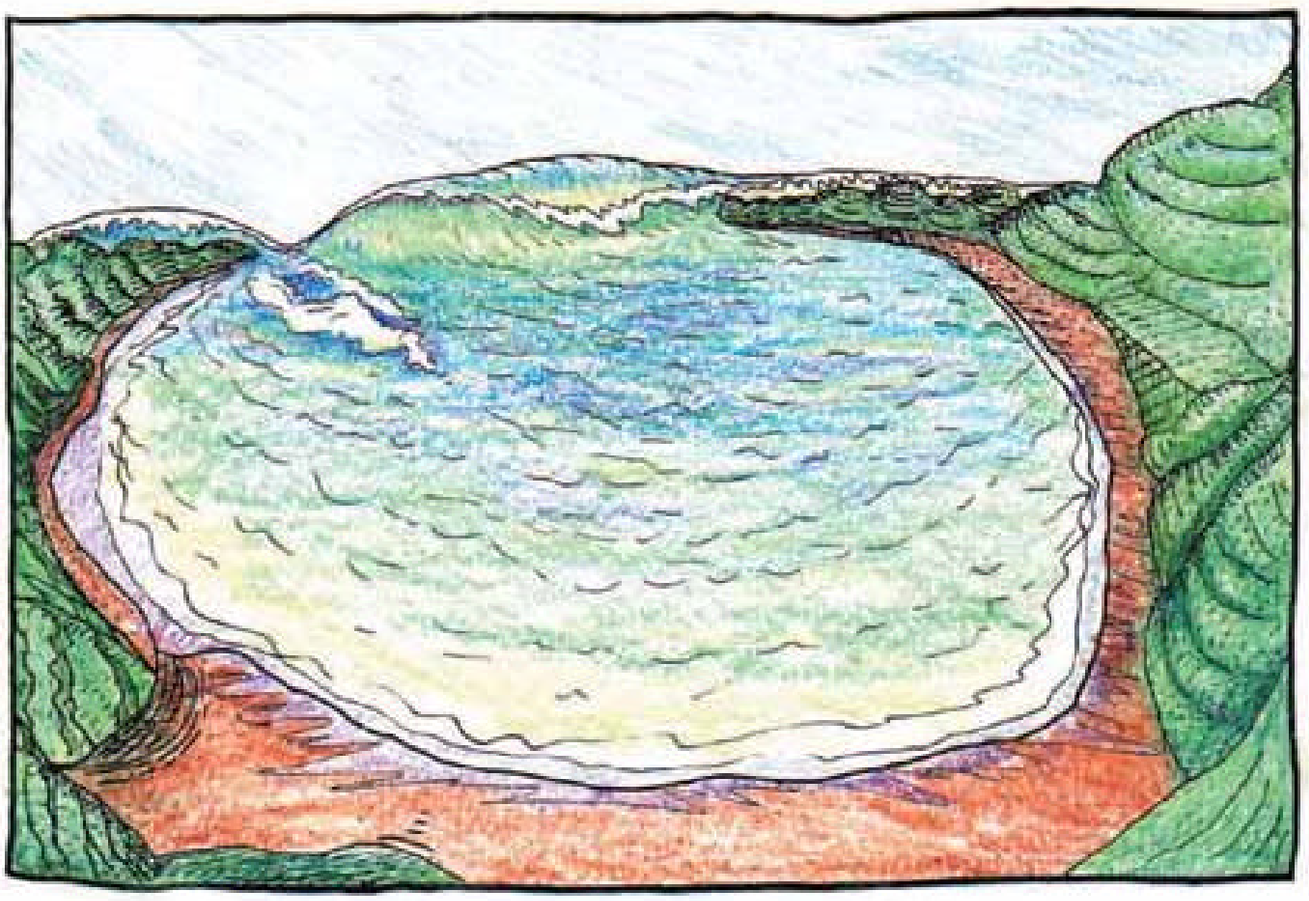


Donna remembers learning that rising water or receding water are sure signs that a tsunami will arrive soon.

At 2pm the first tsunami waves arrives. Around some parts of islands, coral reefs help to break the force of the tsunami.

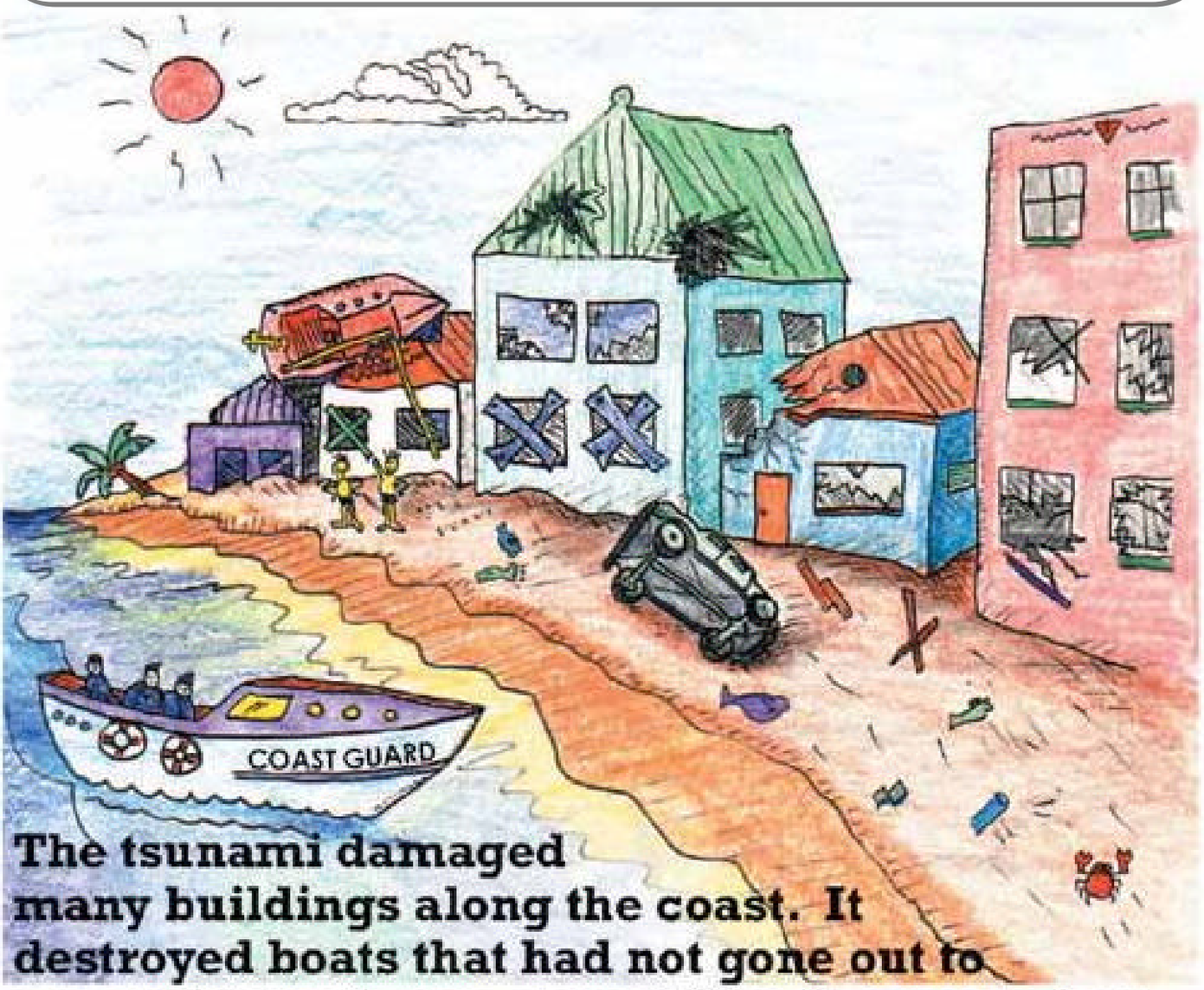


.. Some shores are protected by trees and mangrove forests which lessen the wave force even more. But the waves in these areas can still be large and dangerous.



At bays, the waves can be very big because the sides of the bay shorten the length of the wave and push it upwards. The tsunami waves come ashore for hours.

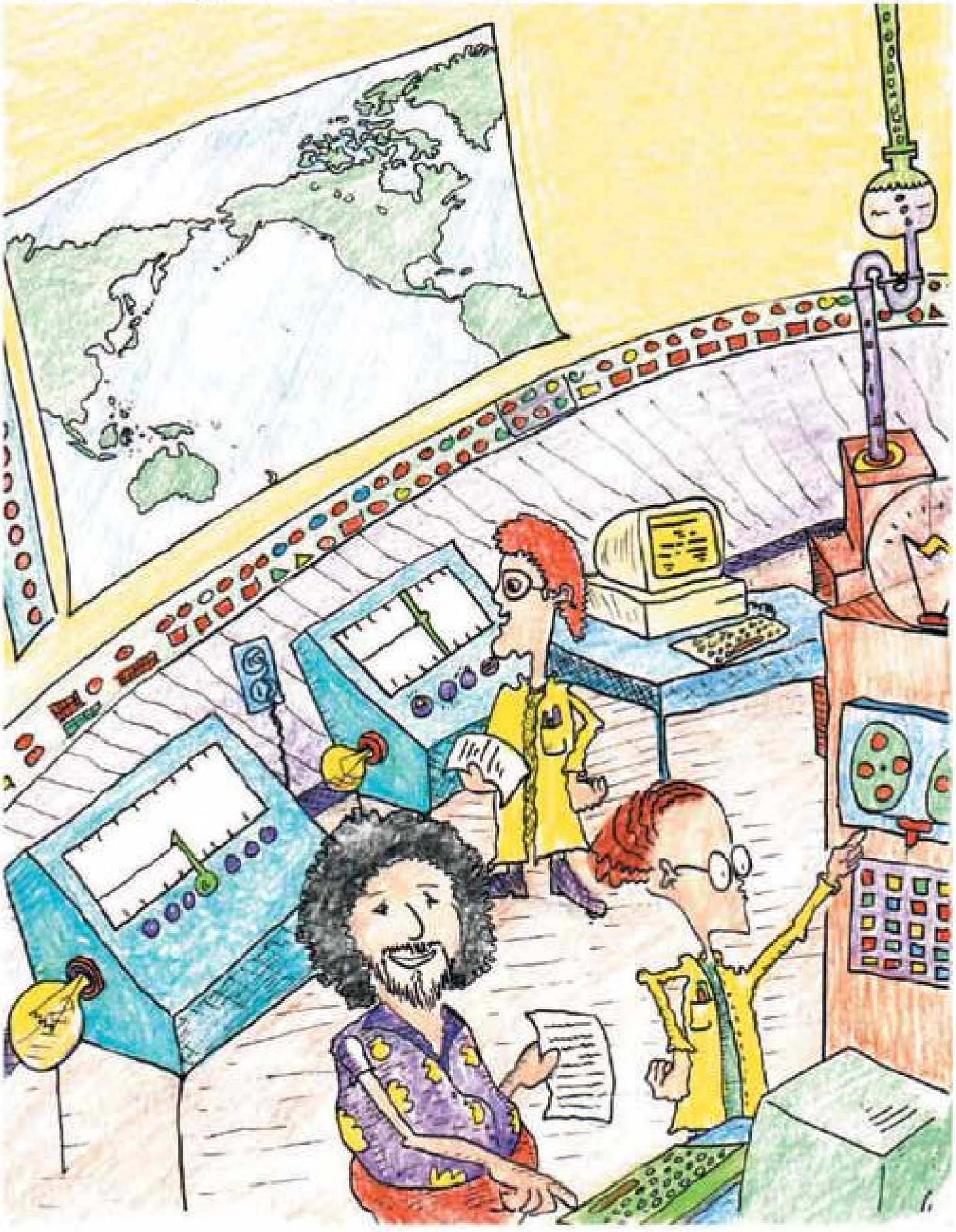
When the tsunami waves become small and cannot cause any damage, the Tsunami Warning is cancelled. Everyone must still wait for the National Tsunami Focal Point to give the “ALL CLEAR” signal that tells them it is safe to return to their homes and offices.



The tsunami damaged many buildings along the coast. It destroyed boats that had not gone out to sea and tossed cars around like they were toys. It tore open walls and roofs of buildings and flooded all the danger zones.

Donna was glad that no one was hurt. They were prepared and left the danger zones when they heard the tsunami warning. People now work to repair their buildings so life can return to normal.

Since scientists at the Tsunami Warning Centers around the world are always on watch for the next sign of a tsunami and we also know the warning signs for ourselves, we can protect our lives today and in the future.



Rev. 31 May 2011

By

NEMO – Saint Lucia

United Nations
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Intergovernmental
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1960-2010

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Adapted for the English-speaking Caribbean through the
Tsunami and Other Coastal Hazards Warning System Project
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