

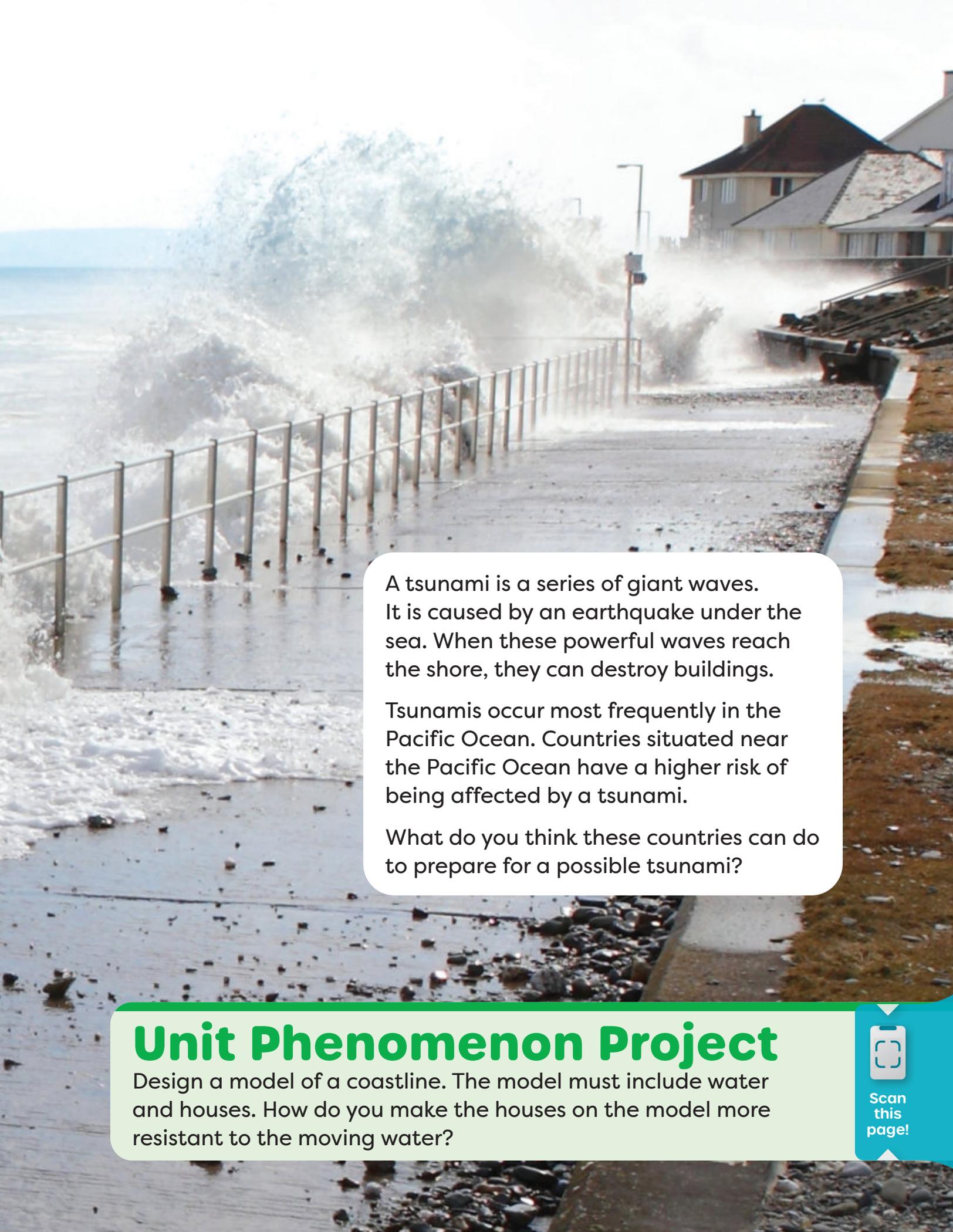
UNIT

1

Energy and Waves

Chapter 1A:
Energy

Chapter 1B:
Waves



A tsunami is a series of giant waves. It is caused by an earthquake under the sea. When these powerful waves reach the shore, they can destroy buildings.

Tsunamis occur most frequently in the Pacific Ocean. Countries situated near the Pacific Ocean have a higher risk of being affected by a tsunami.

What do you think these countries can do to prepare for a possible tsunami?

Unit Phenomenon Project

Design a model of a coastline. The model must include water and houses. How do you make the houses on the model more resistant to the moving water?



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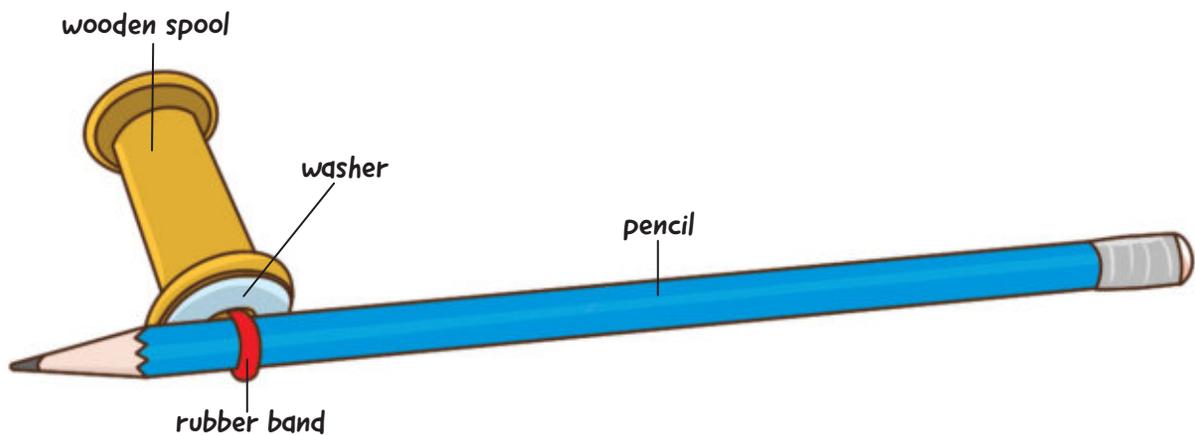


Essential Question

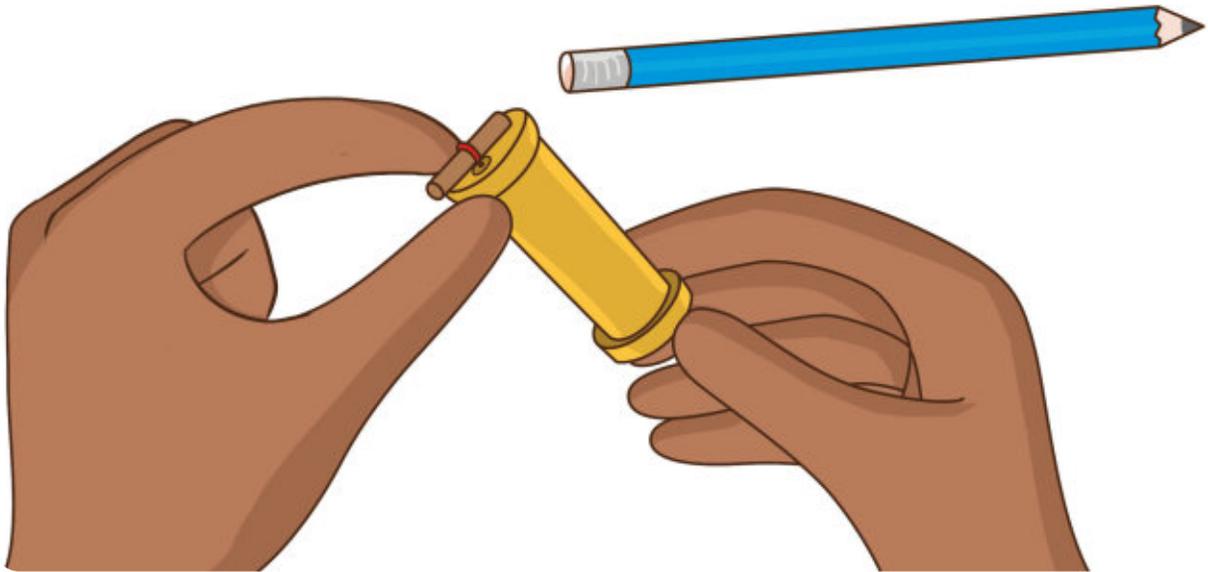
Why does a wind-up toy move when you rotate the winder?

Chapter Project

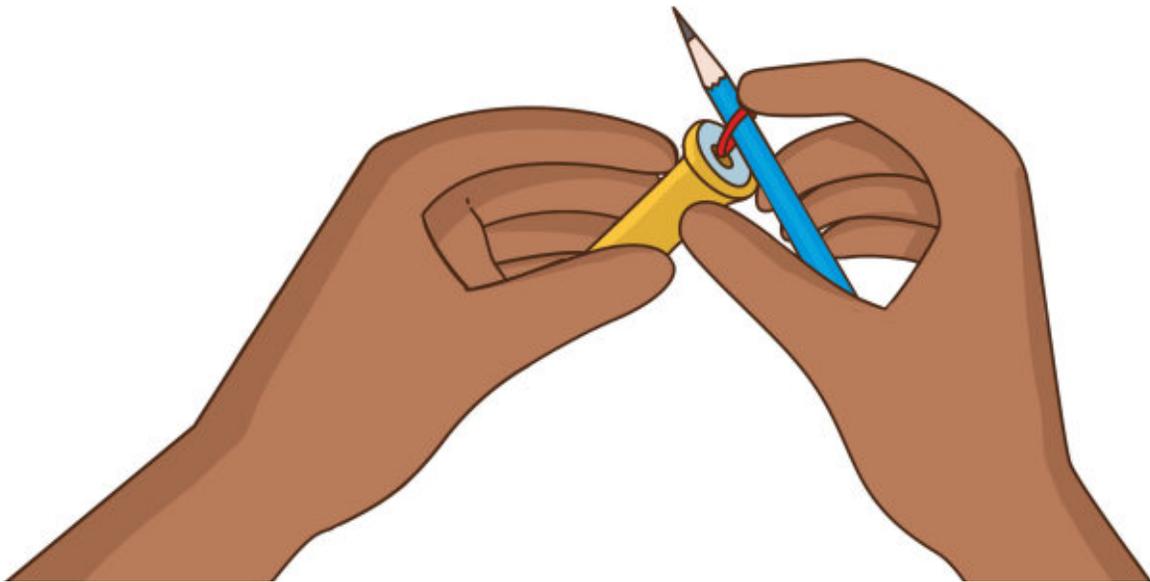
A spool racer is a wind-up toy that you can easily make using simple materials. The pencil of the spool racer works like a winder. When the spool racer is wound up and then released, it will move. Build a spool racer using the steps on the next page.



1. Push a rubber band through the middle of the spool using a thin stick.
2. Break a small piece of the wooden stick to help secure the rubber band. Tape the wooden stick to keep it in place.



3. Place the washer on the other end of the spool. Secure the washer by placing the pencil through the rubber band.



4. Turn the pencil a few rounds to wind up the rubber band.
5. Release the spool racer on a table and watch it move.

Lesson 1

Forces and Energy

Key Terms

convert

transferred

Recall

1. The forces acting on a resting object in opposite directions are b_____.
2. An object will start moving when the sum of forces acting on it is not z_____.

Engage



Make It Move



Look at the picture of the merry-go-round in the park.

1. How do you make this merry-go-round move? What types of forces are acting on the merry-go-round?
2. What would you do if you want it to move faster?

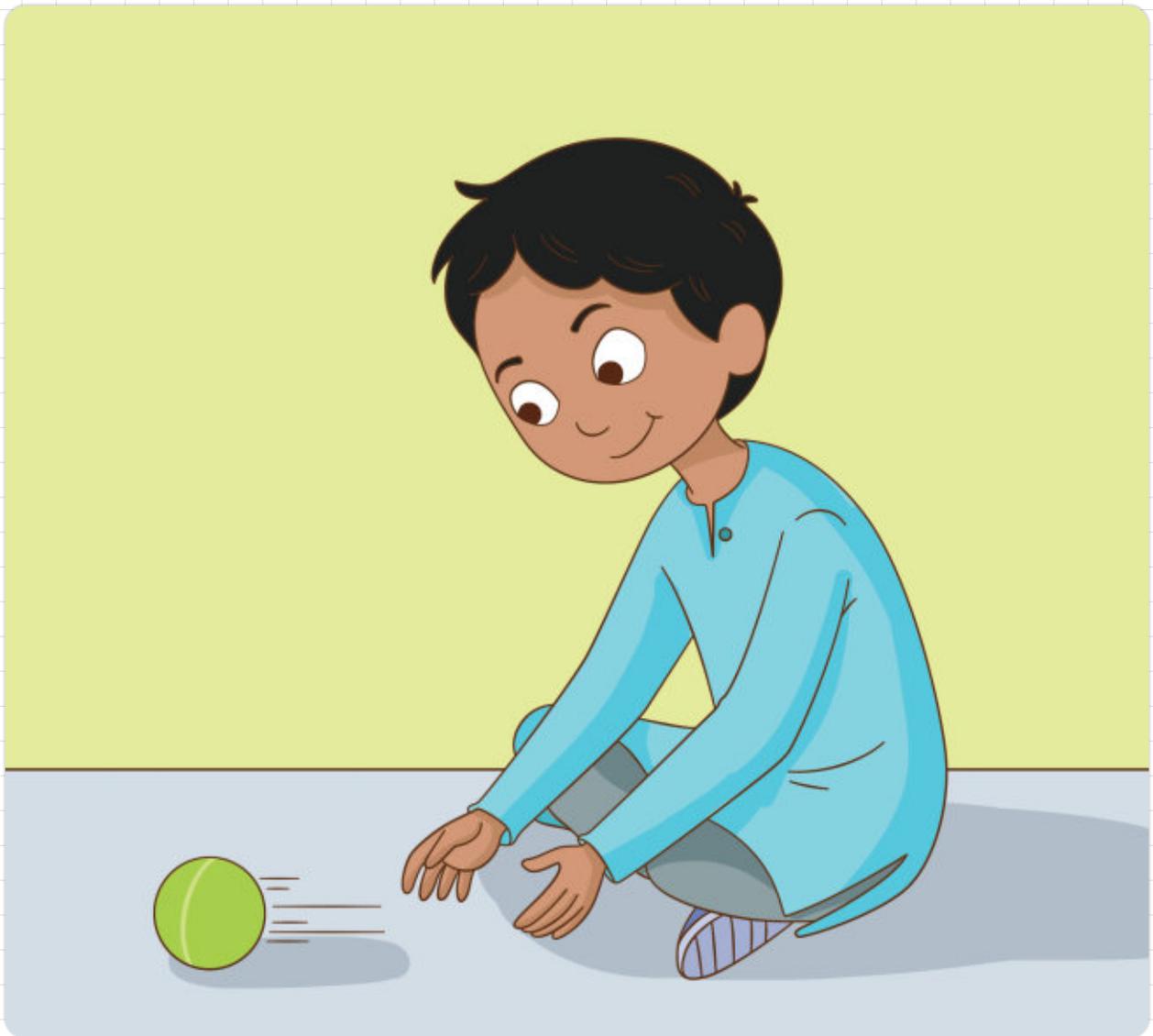


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Move the Ball

In **Engage** on page 6, you learned how the strength of forces can affect how a merry-go-round moves. Now, you will **Explore** how a force can make an object move faster or slower.

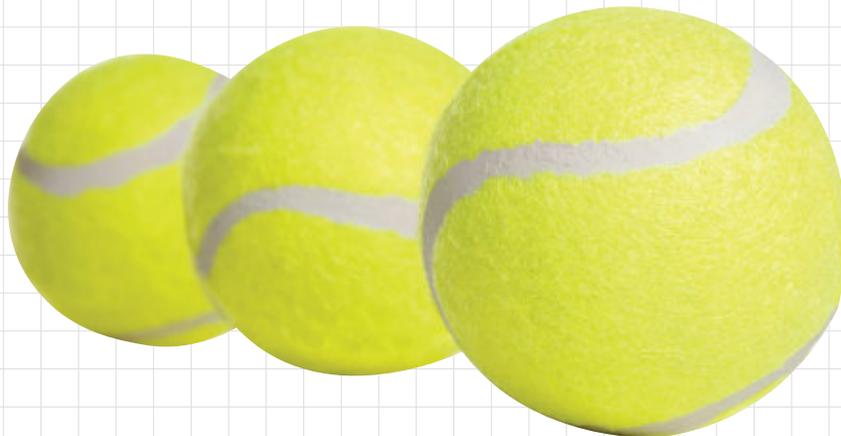


1. Take a tennis ball. Push it gently so that it rolls on the floor.
2. Make the ball move faster or slower by changing the amount of force you use to push it.

3. Circle your observations in the table below to show the results.

Amount of force used	How fast does the tennis ball move?		
Least	Slowly	Quickly	Very quickly
Less	Slowly	Quickly	Very quickly
Greatest	Slowly	Quickly	Very quickly

How does the amount of force used to push the tennis ball change the speed that it moves at?





What Is Energy?

In **Explore**, you observed that when you pushed the ball using a greater force, the ball moves quicker. This happens because of the amount of energy the moving ball possesses.

Energy is the ability to do work. Energy can exist in different forms. Energy can be **converted** from one form to another, and it can also be **transferred** from one object to another object or to the surroundings.

When we eat, the energy in the food is transferred to our body to be stored. This stored energy is then converted to other forms of energy, allowing us to do different things.

Energy allows us to:



move around



learn

In what other ways is energy important in our daily lives?