Have you ever wondered how all the food that you eat gets digested?
What are we talking about regarding food, how you smell it or how you digest it? digest it

It is not only the acid in your stomach that breaks down your food
What breaks down food in your stomach? acid

—many little molecules in your body, called enzymes, help with that too.
What helps break down food? enzymes

Enzymes are special types of proteins that speed up chemical reactions,
Enzymes do what to chemical reactions? speed up

such as the digestion of food in your stomach.
Where do you digest food? your stomach

In fact, there are thousands of different enzymes in your body that work around-the-clock to keep you healthy and active.
How many different enzymes are in your body? thousands

In our science fair project, you will investigate one of these enzymes, called catalase,
What enzyme are we investigating? catalase

to find out how it helps to protect your body from damage.
Catalase protects your body from what? damage

Enzymes are essential for our survival.
What else is essential for our survival?

These proteins, made by our cells,
What are enzyme made by? our cells

help transform chemicals in our body, functioning as a catalyst.
Enzymes function as what? a catalyst

A catalyst gets reactions started and makes them happen faster,
Catalysts get reactions started and make them happen how? faster

by increasing the rate of a reaction that otherwise might not happen at all, or would take too long to sustain life.
Sometimes catalysts increase the rate of reaction or the reaction might not what? happen at all

However, a catalyst does not take part in the reaction itself
A catalyst does not take part in what? the reaction

—so how does this work? Each chemical reaction needs a minimum amount of energy to make it happen.
What do you need to make a chemical reaction happen? energy

This energy is called the activation energy.
Let's spell activation energy.

The lower the activation energy of a reaction, the faster it takes place.
The lower the activation energy, the faster or slower it takes place. Faster

If the activation energy is too high, the reaction does not occur.
What happens if the activation energy is too high? the reaction does not happen

Enzymes have the ability to lower the activation energy of a chemical reaction by interacting with its reactants
Enzymes have the ability to do what to the activation energy of a chemical reaction, lower it or make it higher? lower

Reactants are the chemicals doing the reacting.
What are the chemicals doing the reacting? reactants
How do you react when you are happy?
What about when you are scared?

Each enzyme has an active site, which is where the reaction takes place.
Where does the reaction take place? at an active site

These sites are like special pockets that are able to bind a chemical molecule.
What does it mean to bind to something? can give choices like repel or stick together

The compounds or molecules the enzyme reacts with are called their substrates.
The enzyme reacts with what? substrates

The enzyme pocket has a special shape so that only one specific substrate is able to bind to it,
Can you think of something that you can compare this to? What about a key in a lock or a combination safe?

Once the molecule is bound to the enzyme, the chemical reaction takes place.
Once what is bound to the enzyme, the chemical reaction takes place? molecule

Then, the reaction products are released from the pocket,
When something is released is it let go or kept? let go

and the enzyme is ready to start all over again with another substrate molecule.
What happens after the chemical reaction, does it stop or start over again? start over

Catalase is a very common enzyme that is present in almost all organisms that are exposed to oxygen.
Catalase is present in almost all organisms that are exposed to what? oxygen
What do you think of when you hear the word oxygen?

The purpose of catalase in living cells is to protect them from oxidative damage,
The purpose of catalase in living cells is to protect them from what? oxidative damage

which can occur when cells or other molecules in the body come into contact with oxidative compounds.
What is a synonym for occur? happen

This damage is a natural result of reactions happening inside your cells.
How about a synonym for damage? hurt, disrupt, injure

The reactions can include by-products such as hydrogen peroxide, which can be harmful to the body,
By-products like hydrogen peroxide can be what? harmful to the body

Can you think of a by-product of a bonfire (draw an example of people sitting around a bonfire with or without student)?
can be unwanted smoke that makes you cough or stings your eyes.

To prevent such damage, the catalase enzyme helps getting rid of these compounds
What are some things that you get rid of? old clothes/toys, garbage, etc.

by breaking up hydrogen peroxide (H_2O_2) into harmless water and oxygen (show the split of hydrogen and oxygen on paper).

Do you want to see the catalyze enzyme in action? In this activity you will disarm hydrogen peroxide with the help of catalase from yeast.

Adapted from: https://www.scientificamerican.com/article/exploring-enzymes/