Eğitim: Eyüboğlu

SUBJECT: SCIENCE
LEVEL: GRADE 6
UNIT: SYSTEMS IN HUMAN BODY
CW: DIGESTIVE SYSTEM

DATE ..../04/2021
NAME -SURNAME:
CLASS NO:

Digestion and enzymes

Our teeth break food down into small pieces when we chew. This is just a beginning to the process of digestion, as food is chewed pieces of it are still not small to be absorbed into the bloodstream. Food has to be broken down chemically into really small particles before it can be absorbed. Enzymes increases the rate of a chemical reaction and is needed to make this happen quickly enough to be useful.

Enzymes

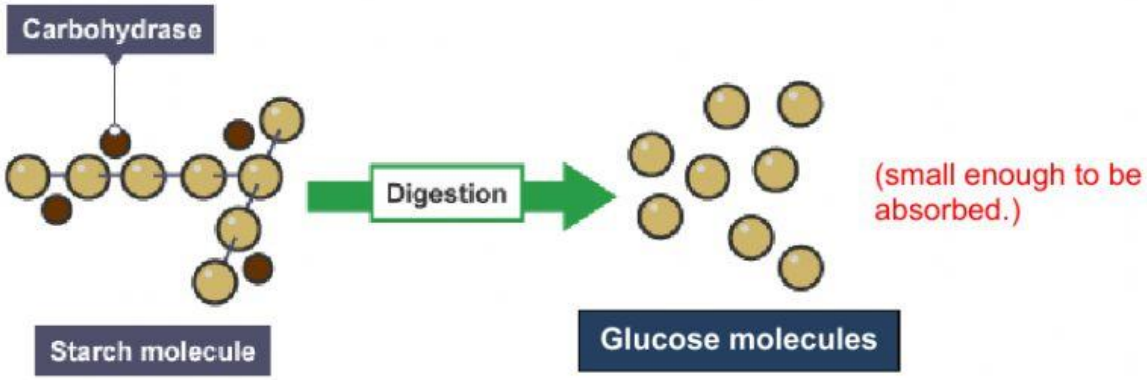
Enzymes are not living things. They break large molecules into small molecules. Different types of enzymes can break down different nutrients:

- amylase and other carbohydrase enzymes break down **carbohydrate(starch)** into **sugar**
- protease enzymes break down **proteins** into **amino acids**
- lipase enzymes break down **lipids** (fats and oils) into **fatty acids** and **glycerol**

Carbohydrates (Starch)

Carbohydrates are digested in the **mouth**, **stomach** and **small intestine**. Carbohydrase enzymes break down starch into sugars.

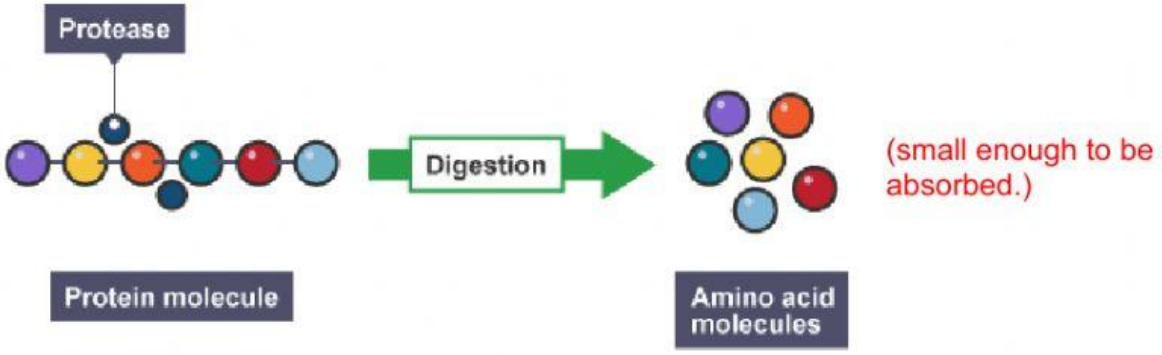
The saliva in your mouth contains amylase, which is another starch digesting enzyme. If you chew a piece of bread for long enough, the starch it contains is digested to sugar, and it begins to taste sweet.



LIVEWORKSHEETS

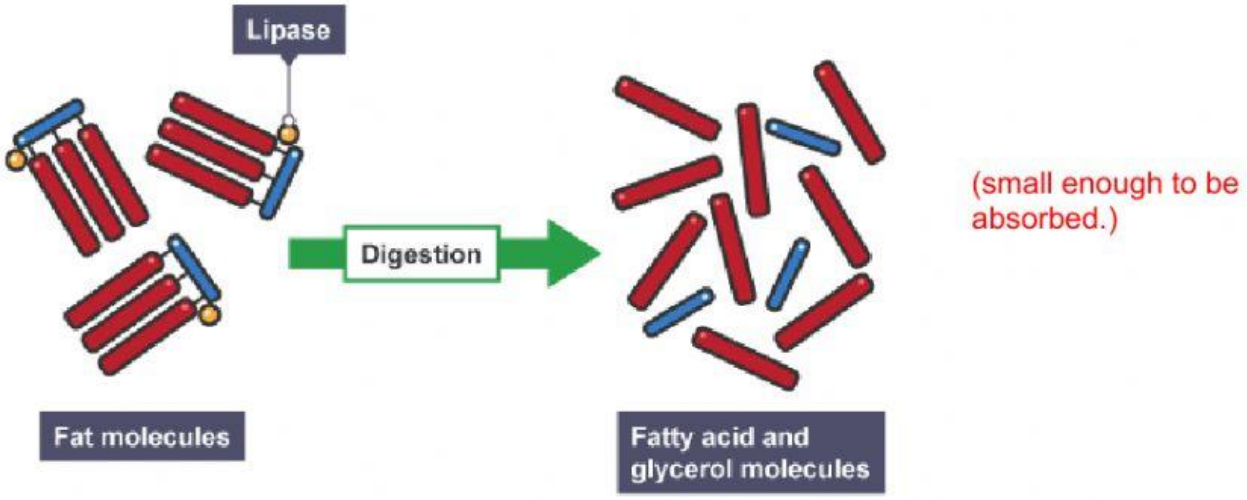
Proteins

Proteins are digested in the **stomach** and **small intestine**. Protease enzymes break down proteins into amino acids. Digestion of proteins in the stomach is helped by **stomach acid**, which is strong hydrochloric acid. This also kills harmful microorganisms that may be in the food.



Lipids (fats and oils)

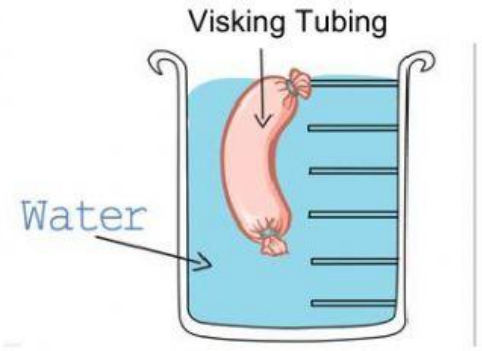
Lipase enzymes break down fat into fatty acids and glycerol. Digestion of fat in the **small intestine** is helped by **bile**, made in the liver. Bile breaks the fat into small droplets that are easier for the lipase enzymes to work on. Bile is not an enzyme.



Modelling the digestive system

This is a common experiment used to model the digestive system and should help you understand how to work scientifically.

Visking tubing is a semipermeable that allows small molecules like **water** to pass through but does not allow larger molecules.



Aim of the experiment

To use Visking tubing to model the digestive system and show what substances can pass through its lining.

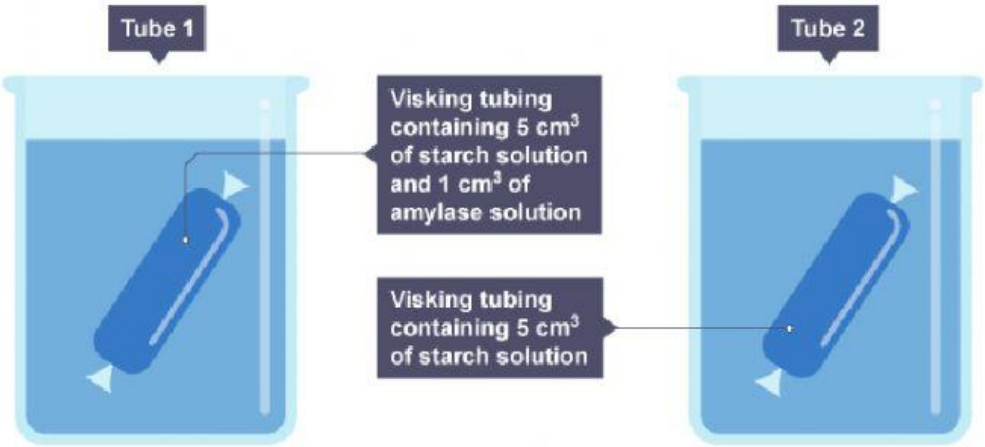
Semipermeable:yarı geçirgen

LIVEWORKSHEETS

Watch the video about Visking tubing experiment.

Method

1. Set up two sets of the apparatus as in the diagram.
2. Put 1cm^3 of amylase enzyme into tube 1 but not tube 2.
3. Leave at room temperature for five minutes.
4. Test for starch using iodine and glucose using Benedict's reagent inside and outside both tubes.



Variables

- **Independent variable** - the presence or absence of amylase.
- **Dependent variable** - the presence or absence of glucose inside and outside the tubing.
- **Controlled variables** - the quantities of the solutions used, the time taken before testing and the temperature of the water.

LIVEWORKSHEETS

Expected results

Tube 1 (with amylase)

	INSIDE THE TUBE	OUTSIDE THE TUBE
CARBOHYDRAE PRESENT	YES / NO	YES / NO
GLUCOSE PRESENT	YES / NO	YES / NO

Tube 2 (without amylase)

	INSIDE THE TUBE	OUTSIDE THE TUBE
CARBOHYDRAE PRESENT	YES / NO	YES / NO
GLUCOSE PRESENT	YES / NO	YES / NO

CONCLUSION

REFERENCES: "Modelling The Digestive System - Digestive System - KS3 Biology Revision - BBC Bitesize". *BBC Bitesize*, 2021, https://www.bbc.co.uk/bitesize/guides/z9pv34j/revision/4.

LIVEWORKSHEETS