



# Theatre of Science Nutrients 1: Fats!

To join in bring:  
Plate, milk (any),  
spoon, food  
colouring,  
washing up liquid.

Put the first letters of your answers together; what's the mystery word?!



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things: it's  
the only way  
this can be  
my job!

- 1) Lipid that's solid at room temperature: \_\_\_\_\_
- 2) Lipid that's liquid at room temperature: \_\_\_\_\_
- 3) Lipids don't dissolve in \_\_\_\_\_
- 4) Wax and some vitamins are \_\_\_\_\_

## Today we'll:

Learn that fats and oils are a type of lipid, and the definition of lipid.

Learn the basic chemical structure of glycerol, fatty acids and triglycerides.

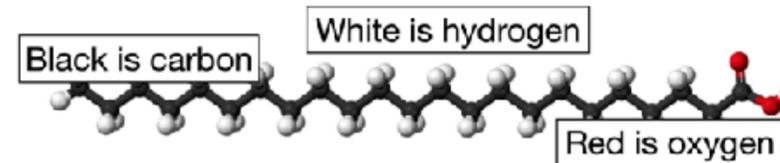
Learn what our bodies do with fats.

Learn which foods contain which fats.

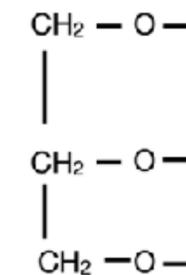
Finished? List 6 foods that you think might be good for you and high in fat.

Fats are made of glycerol & fatty acids.

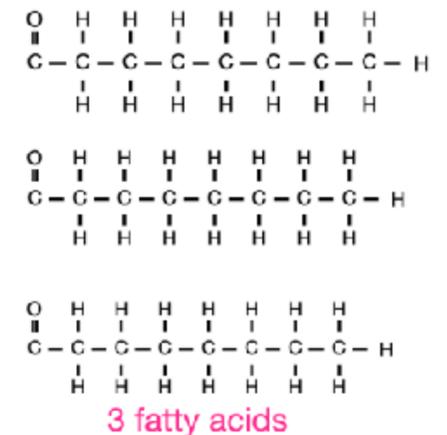
These are long chains of carbon particles.



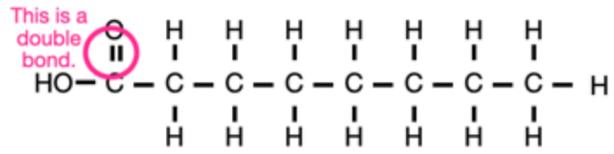
A particle (molecule!) of tricosylic acid;  
a fatty acid found in fennel.



Glycerol

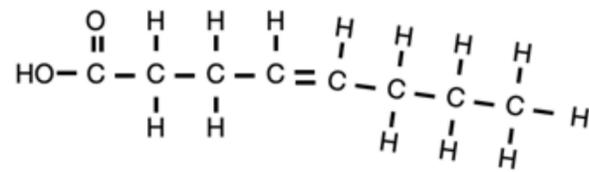


Glycerol absorbs water so is added to foods to keep them moist. It's a food additive - E number - called **E422**.

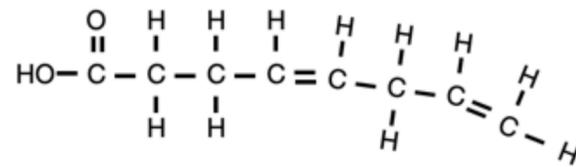


Carbon likes to form four bonds; notice that each carbon here has four!

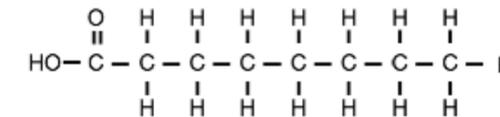
There are single bonds between all the carbon atoms. When that happens we say the fatty acid is **saturated**.



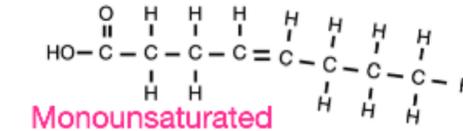
A fatty acid with a double bond between two carbon atoms is **monounsaturated**.



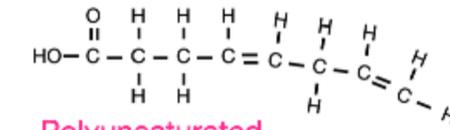
A fatty acid with **more than one** double bond is **polyunsaturated!**



Saturated



Monounsaturated



Polyunsaturated

The unsaturated fats are bent so they don't stack as neatly as the saturated fats.

Which ones do you think are solids and which are liquids?

Saturated fat is usually a \_\_\_\_\_  
 Unsaturated is usually a \_\_\_\_\_

Fattiest organ in the body?  
 \_\_\_\_\_

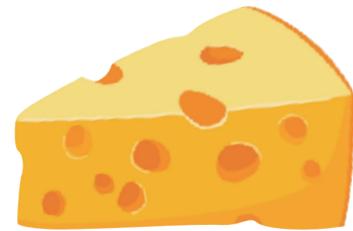
Olive Oil



Brazil nuts

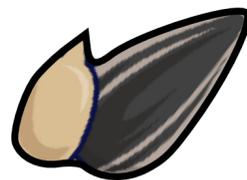


Hard Cheese



Which ones do you think are high in saturated fat?

Sunflower seeds



Chocolate



Avocado



Which ones contain two or three types of fat?

Types of fat: Saturated Monounsaturated Polyunsaturated



# Theatre of Science Nutrients 2: Carbohydrates

**To join in bring:** Small cup of oats, hot water, paper (activity 1) cornflour and water (activity 2) small piece bread/cooked potato/cooked rice (activity 3).

### Today we'll:

Learn about glucose, fructose and sucrose; how they are 'simple sugars' that can appear in foods as free sugar, or be stored in whole fruit.

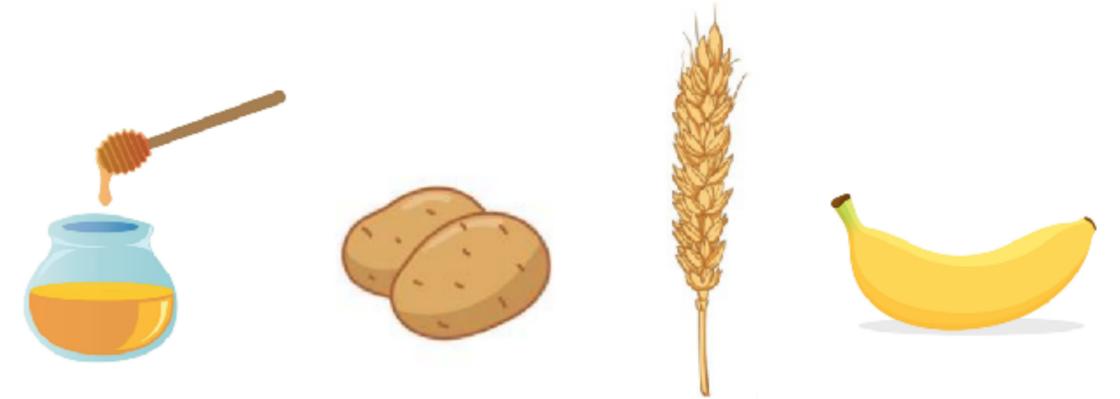
Learn how starch and cellulose differ from simple sugars and from each other.

Learn the health benefits and risks associated with eating different carbohydrates.

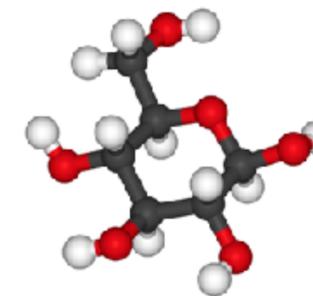
1) Can you fill in any of the gaps to show different words that mean the same thing in British and American English? The first's been done for you.

American English	British English
Candy	Sweets
	Sofa
	Corn flour
	Rubbish
Pants	

These foods are rich in carbohydrates. Which come from plants, and which from animals?



\_\_\_\_\_  
\_\_\_\_\_



A particle of glucose

Glucose, sucrose and fructose are all examples of simple

\_\_\_\_\_.



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Put a dot next to the foods and drinks you think contain 'free sugar'.



Put a cross next to the ones that don't contain useful nutrients!

Starch is a type of \_\_\_\_\_.

Most starch has to be \_\_\_\_\_

before being eaten. Some starchy food is digested within half an hour, giving the body a burst of energy. Starchy foods that are digested quickly include: \_\_\_\_\_

\_\_\_\_\_. Some starch, in foods like \_\_\_\_\_

\_\_\_\_\_ makes our blood sugar levels rise slowly and is better for us.

Fibre is also a carbohydrate! Our bodies can't digest it! So why is it good for you?!





# Theatre of Science Nutrients 3: Protein

To join in bring: Plate, milk, vinegar. (Sorry I said on the original invite to bring candle and strand of hair but we'll save that for this week's Lego Show where we'll talk more about proteins!)

## Today we'll:

Learn that there are many different proteins and what proteins are built from.

Hear that our bodies rely on thousands of proteins and learn about a few examples

Learn what foods are high in protein and other factors to consider when choosing a diet rich in protein.

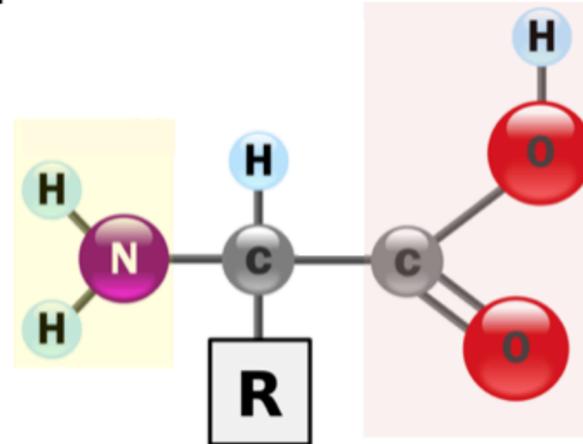
## An amino acid!

Which bit is the..?

Carboxyl group

Amino group

Part that changes depending on which amino acid it is.



Draw lines to show the answer.

Proteins do LOADS of different jobs. They can be:

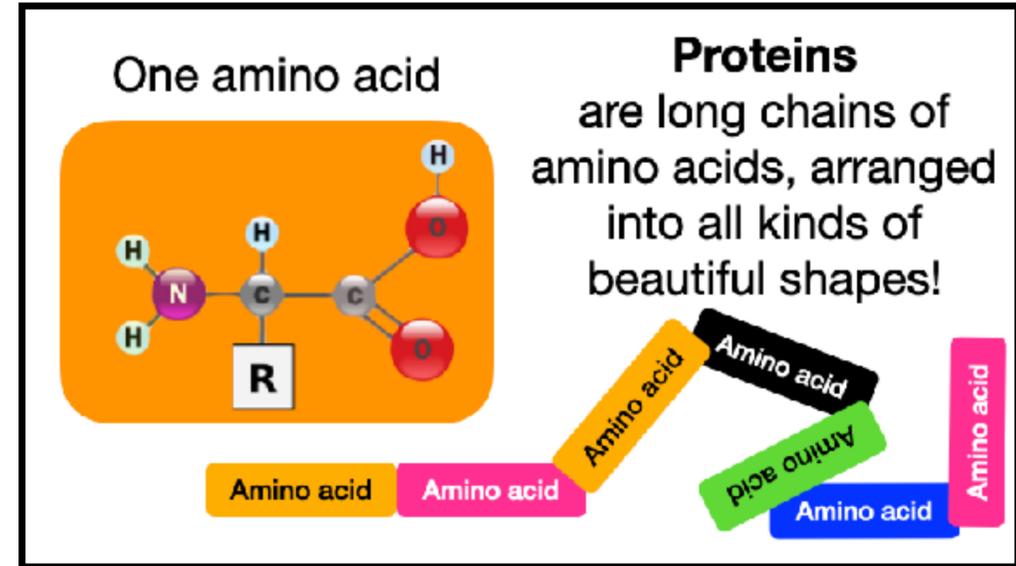
Enzymes

Hemoglobin

Antibodies

Keratin

They're in your muscles, bones, skin... over 10 000 in your body right now!



Hummus



Steak



Egg



Lentils



Baked beans



Brazil nuts



Rank these foods by how much protein you think they have.

1 = the most, 6 = the least.

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Put this sheet aside until the end of the lesson!

1) Complete this list of proteins in our bodies:

Hemoglobin in our \_\_\_\_\_.

Anti\_\_\_\_\_ which attach themselves to germs.

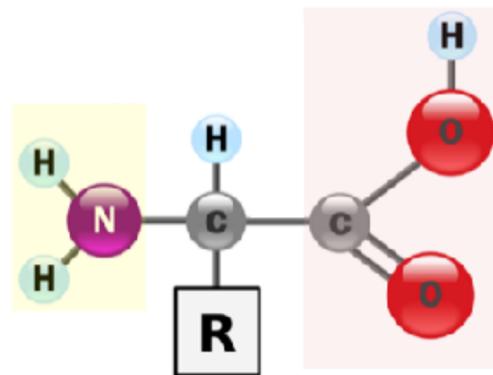
En \_\_\_\_\_ which help us digest food

2) What is this particle called?

A: Protein

B: Amino acid

C: Carboxyl group



3) Can you find TWO foods high in protein that we've mentioned today?

P	A	B	A	Q	O	I	P
E	L	E	N	T	I	L	A
A	C	A	R	R	O	T	T
R	L	N	B	O	F	J	P
O	L	I	V	E	O	I	L

There are low-protein foods in there to try and confuse you.

And one high-protein food we haven't mentioned, hiding inside a low protein food!!



# Theatre of Science Nutrients 4: Vitamins and Minerals

**To join in bring:** Chalk and/or white 'chalky' stones, vinegar (activity one), fortified cereal, magnet (activity two).

## Today we'll:

Hear about the difference between vitamins and minerals.

Hear some examples of vitamins and minerals and what processes they assist with in the human body.

Learn about which foods are rich in vitamins and minerals.

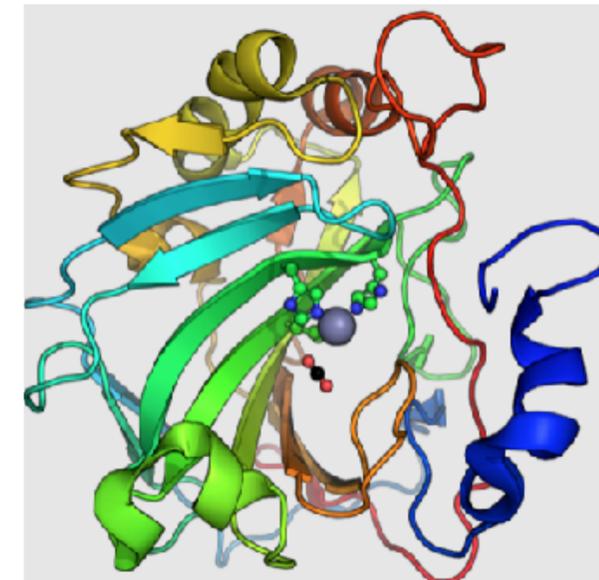
Can you sort these objects into two categories?



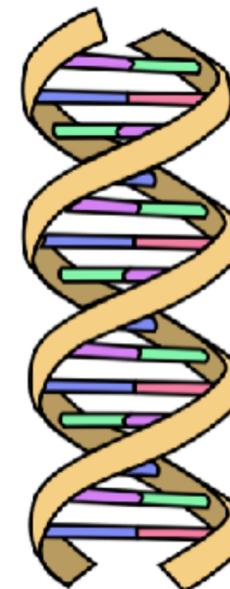
Any ideas as to what this has to do with vitamins and minerals?!



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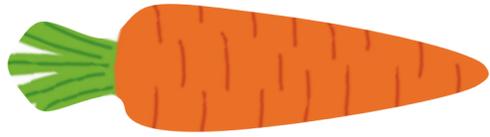
Carbonic anhydrase lets us breath out carbon dioxide!  
The tiny grey particle in the centre is the mineral \_\_\_\_\_.



- █ = Adenine
- █ = Thymine
- █ = Cytosine
- █ = Guanine

DNA

What's missing?!



Riboflavin, niacin, and vitamin C are examples of...

- A: Vitamins
- B: Minerals
- C: Vitamins and minerals



Which of these elements are not needed by the human body?

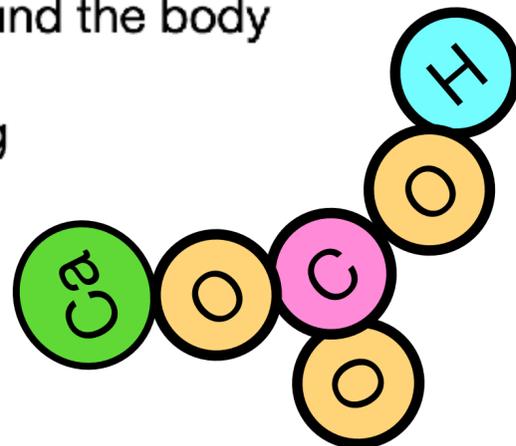
- Silver
- Zinc
- Copper
- Phosphorus
- Calcium
- Iron
- Lead

Which of these is a good way of getting vitamin D?

- A: Being outdoors
- B: Eating meat
- C: Eating leafy vegetables

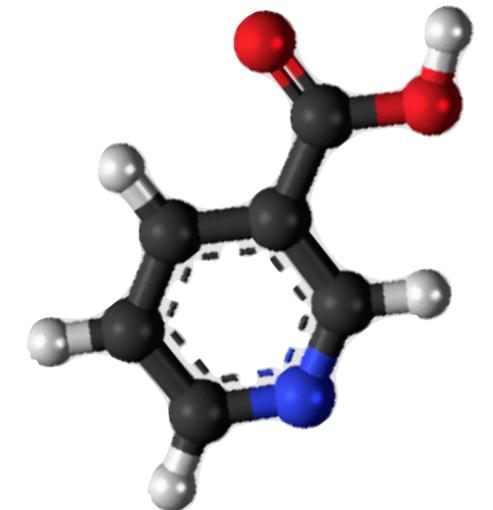
Which of these things your body does needs minerals to happen?

- A: Breathing out carbon dioxide
- B: Carrying oxygen round the body
- C: Making DNA
- D: Muscles contracting
- E: A and B
- F: A, B, C and D.



Name two foods rich in calcium

\_\_\_\_\_ and \_\_\_\_\_





# Theatre of Science Nutrients 5: Food Labels

**To join in bring:** A variety of food labels (can still be on the food!) from around your house.

## Today we'll:

Learn what information is required on a food label under UK law.

Find out when companies can and can't make claims about their products.

Learn the meaning of some of the terms on food labels, such as 'E numbers' 'Source of' and 'High in'.

Name of the food

Best before / use by date

Nutritional information

Which of these bits of information do you think **HAVE** to be on a food's label in the **UK**? **Circle** them.

Allergy warnings

Traffic light colours

If it has no added sugar

Whether it can treat diseases

The ingredients

The weight



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Which of these nutrients do you think the food manufacturers **HAVE** to tell you about on the label?

Vitamins

Saturated Fat

Polyunsaturated Fat

Protein

Carbohydrates

Carbohydrates that are sugar

Minerals

Salt

Protein

Fibre



Tick if found!

**How many of these words and phrases can you find on your food labels?!**

An E number (the letter 'E' then a number)

“With sweetener”

“Whole grains”

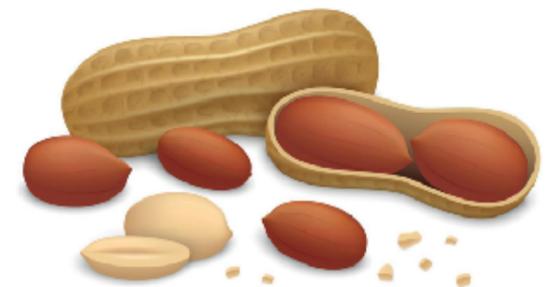
Some ingredients in bold/italics/underlined

“May contain”

“High in”

“Source of”

“Calcium is needed for the maintenance of normal bones”.



## Questions!

Name two things that must be added to this 1918 label for Sweet Wrinkled Peas (!?) if it was to be sold in the UK today.



Which of these must be mentioned on a food label?

P: Iron

T: Polyunsaturated Fat

S: Carbohydrates

Which of the following is a fact about E numbers?

E: They have been proven to not cause hyperactivity in children

A: Some might cause hyperactivity in children

O: They all cause hyperactivity in children

Which of these must be written in bold, italics, or underlined?

W: Eggs

T: Flour

C: Sugar

What is a problem with artificial sweeteners?

P: They can cause tooth decay

N: Sugar is more nutritious

M: They could encourage people to eat less nutritious food.

What does NOT legally have to be on a food label?

S: The full ingredients list

P: Traffic light colours

K: The amount of protein the food contains per 100g

What's the word?

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