

# Wheat













### A history of wheat

Wheat was developed from wild grass plants in Syria and the surrounding Middle East approximately **10,000** years ago!

It was the first crop to be cultivated and is now the third most widely grown crop in the world.





#### Growing wheat

Wheat has a relatively short growing season and thrives in temperate climates.

The wheat seed is the part of the plant that we use. Most commonly known for being ground into flour for making bread.

The stem, leaves and roots of the plant are usually recycled by the farmer, either being ploughed back into the soil, or used as livestock feed.





#### How much wheat?

**One** wheat seed planted in a pot grows into a plant with several shoots. By the time the plant is ready to harvest, its flowers will contain around **500** seeds. (1 seed produces 500 seeds!)

Although, in a farm field its more like 180 seeds per plant as the plants are growing very close together and so can't grow as big...





Types of wheat

Hard Wheat

Bronze coloured High **gluten** content Flour used for bread making



Light golden coloured High **starch** content Flour used in pastries, desserts and sauces



#### Gluten and starch

#### Gluten

- Protein naturally occurring in wheat.
- Acts like a binder, holding food together and adding a "stretchy" quality.



Microscope Images of Internal Structure of Gluten from Extra Strong and Weak Bread-Making Wheat Varieties. Image credit: B Khatkar and V Dhaka, Journal of Food Quality

#### Starch

- Carbohydrate naturally occurring in wheat.
- Often used as a thickener, filler and stabiliser.





### Wheat Breeding

Through the years, certain wheat varieties have been bred with others to produce desirable traits in the offspring plant.

For example, plants have been bred to;

- grow in harsher climates
- resist diseases
- produce more wheat seed (bigger yields)

DNA is tightly wound up into structures called chromosomes in plant cells. This holds all the instructions that tell a plant how to grow. When plants are bred (crossed) they swap information and pass on a new mixture of traits to their offspring.





#### Wheat diseases

Some types of wheat are more susceptible to some diseases than others.

A winter wheat variety called Vuka is susceptible to a disease called Yellow Rust that's caused by a fungus.

In this microscope image you can see spores of the yellow rust fungus bursting out of the wheat leaf.







## Science Activity One

The Wheat Guessing Game



#### Question 1

If we planted one wheat seed in a pot – How many roughly could we expect to get back when the wheat plant is harvested?

- A 5
- B 10
- C 100
- D 500





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What does a wheat seed need to germinate?

- A A nice bedtime story
- B Sunshine
- C Warmth and water
- D Coca cola







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Which of these plants is most related to wheat?

- A Carrots in a farmer's field
- B Grass in a playing field
- C Cabbages in a garden
- D Peas on a plate







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What is the smallest part of a wheat plant?

- A Leaf
- B Seed
- C Cell
- D Root







What is the smallest part of a wheat plant?









Who grows the biggest yields of wheat in the world?

- A UK
- B Germany
- C Russia
- D USA







Who grows the biggest yields of wheat in the world?



D USA







## Science Activity Two

**Discovering Wheat Plants** 



#### **Discovering Wheat Plants**

Materials for each group

- 2-3 wheat plants
- magnifying glasses
- pencil and plant labelling sheet
- Ruler/tape measure





### Have a look at the wheat plants on your table

- How many different plant parts can you identify?
- Fill out the worksheet

Roots Ear Stem Leaves



#### Measure your plant

- How tall is your plant?
- How many stems and leaves can you count?
- How many seeds are in a single wheat ear?





### Taking a closer look at your plant

Using a microscope or magnifying glass:

- Can you see any flowers?
- Do they look like flowers?





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## **Science Activity Three**

**Gluten Balloons** 



### Gluten Balloons

#### Materials per group

- Sieve/colander
- Bowl
- Spatula/spoon
- Bread flour
- Mug

And a bicycle pump!





#### Method

#### 1. First create a dough ball

Add 2 mugs of flour into the bowl and <u>slowly</u> mix in 1 to 1 ½ mugs of water.

Stirring to create a dough ball.



#### 2. Wash out the Starch

Place the dough ball in the sieve and wash out the starch. Squeeze the dough to wash it thoroughly. Once the water runs clear you have a gluten ball!





#### 3. Create your balloon!

Dry your gluten ball and knead it so it appears smoother. Flatten it out slightly and then wrap it around the end of the pump. Make sure there are no gaps.

Now pump up your gluten balloon!



#### Questions

- How big can you make your balloon?
- How has the texture of your dough ball changed since washing out the starch?
- You used bread flour to create your gluten balloon. Do you think your balloon would be different if you used a different flour to make it?







# Writing Activity



Poetry

During this session we will use the concepts, experiences, images and new vocabulary from the science as a starting point for writing poetry!

What you will need: Pen/pencil Paper lined or plain Your word bank Science images





#### A Dream of Wheat

From a plain packet of seeds

comes sunsweetened stalks

seasoned by wind and rain –

birds diving mice hiding grasshoppers singing spiders weaving --

in a sea of wheat that will someday

become bread we eat.

- By Irene Latham





### Wheat inspired poetry

Use the word bank we created earlier to help you!

Can you think of some "wheat" words?

Some things to think about:

Does wheat make a sound?

What does it look like?

Can you think of what wheat smells like?





# Lunchbéx Scyence Art Activity One

# Wheat collage



#### Wheat Collage

Materials:

Paper and pencil

Glue

Wheat (seeds and ears)



 Working in pairs, draw around your hand – you have created a wheat flower shape!



2. Decorate your wheat flower with the seeds and wheat ears you used in the science activity and cut it out. Let it dry



# Lunchbéx Scyence Art Activity Two

## Wheat Varieties



#### Wheat Varieties

Materials: Clay Clay carving tools Wheat parts Rolling pin



 Experiment making patterns!
 Roll out some clay and experiment with what patterns you can create by pressing parts of the wheat plant into the clay and using any tools that you have.



2. Create a chromosome tile!Roll out some clay and cut outa square tile shape for yourfinal pattern design.

