



SESSION 3

How can we prevent pests eating the seeds?



Match the name of the **arable crop** to the **seed** and then the **product**



barley



wheat



oats

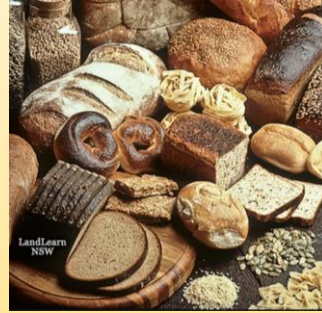


oats



Porridge,
flapjacks,
oatcakes

wheat



Bread, pasta

barley



Beer, barley
water,
scotch broth

oats



Image credits: H. Zell/insatiablenmunch/sebilden

wheat



Image credits: CIMMYT/NSW DPI Schools program/born1945

barley



Image credits: epicbeer/avlxyv/Yoshimai

To

youngengineer@engineeringeducates.org

Bcc

Cc

Add a subject

I need your help!

Dear Young Engineers,

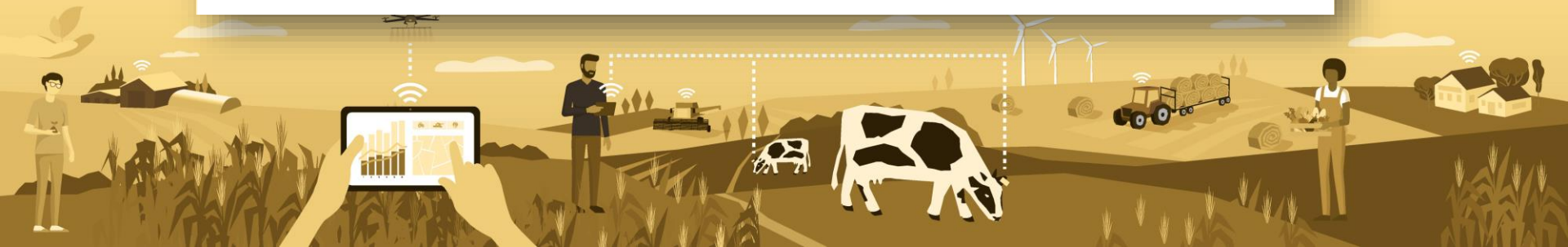
Every year I sow around 460 wheat seeds per every square metre of my fields, and I need at least 400 of these seeds to grow into mature plants if I am going to get the yield I need.

In the last few years, I have seen a rise in pests, like small rodents such as rats and field mice as well as birds like seagulls and crows, eating my newly planted seeds before they germinate. My crop yield is as low as 345 plants per square metre which is a problem.

Although these animals are all important to the ecosystem and I have done a lot to increase biodiversity on my farm. I am seeking solutions to deter them from ruining my crop.

Any suggestions?

Farmer Hannah



Seed Snatchers Challenge



Seed Snatchers Challenge

What's the farmer's problem?

"Once I have sown my seeds, they need protecting so that my crop can grow without being damaged by birds or other animals."

The engineering design task

Can you devise a solution to stop crop damage caused by birds and rodents? Birds are a major problem for farmers. They can quickly decimate an entire crop, leaving the farmer with nothing but empty fields and no income. Some birds, like pigeons and sparrows, will strip seeds from the ground. Other birds such as mice and voles. It is important therefore that farmers protect the crops they have worked so hard to produce whilst still considering the welfare of the animals.

Top tips to get started:

- Think about the features and functions of the device:
 - What animal(s) are you planning to deter?
 - What type of deterrent best suits your purpose?
 - Auditory - what sounds would frighten the animals?
 - Visual - what sights might frighten the animals??
 - Repellents - what smells, feelings and tastes might deter animals?
 - Which parts will be the moving parts of your device?
 - Could your device incorporate a sensor to detect movement?
 - How could the sensor be powered?
 - Will your device be stationary or could it move to different parts of a field?

Available resources:

- Internet access for research
- Large paper for visualising ideas, pens, rulers and drawing equipment

What is the design brief?

Use drawings and/or 3D models to imagine and design a device that will deter birds and small rodents from eating newly sown seeds or crops on a wheat field.

Your device will need to meet the following criteria:

- Be portable
- Be weatherproof
- Should incorporate recycled and sustainable materials
- Incorporate moving parts
- Easy to operate and maintain
- Autonomous (work by itself)
- Not harmful to the animals it deters or cause a nuisance to the public



Background Information:

How might you deter animals that eat seeds?

A gas gun creates a loud sound when the sensor is triggered.



Human figures can deter some animals.

Some animals don't like particular smells.



Some animals don't like super high pitch sounds (ultrasound).



Materials that reflect sunlight will startle and deter animals.

Glossary:

Seeds - the grains of plants used for sowing.

Crops - a plant that is grown in a field on a large scale.

Pest - an insect or other small animal that harms or destroys plants.

Deter - to prevent or discourage someone from doing something.

Deterrent - a thing that discourages or is intended to discourage someone from doing something.

Sowing - to plant or scatter seeds for growing.

Harvest - the process or period of gathering in crops.

Yield - the amount produced of an agricultural or industrial product.

More information and inspiration!

You will probably want to research ideas to deter animals from eating seeds and seedlings. Explore some of these websites:

- [5 ways to protect crops from wild animals](#)
- [How to protect crops from birds.](#)

Want to take it further?

Consider how could you can further improve your device:

- To operate within certain hours of the day?
- To be programmable by the farmer?
- To move by itself?

How well did you do?

Success Criteria	Score /5
Weatherproof and portable	
Incorporating recycled and sustainable materials	
Incorporate moving parts	
Easy to operate and maintain	
Not harmful to animals or a nuisance to the public	

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mice



seagulls



rats



crows





Today we have been working like an engineer by **imagining and planning** possible solutions to the problem of pests eating freshly sown seeds.



SOIL DEFENDERS

