

In our live lesson we are going to be learning all about the amazing and helpful jobs that tractors can do. But that's not all! We're also going to be learning all about the materials that these amazing machines are made from and discovering how they are connected to outer space!

To help you prepare for this exciting lesson, we are challenging you to investigate the answer to this question: **Why do tractors have such big wheels?**



COMPLETE THE FOLLOWING INVESTIGATIONS TO FIND OUT!



Learning objectives:

- Ask simple questions and perform simple tests
- Use observations and ideas to suggest answers to questions
- Gather and record data to help in answering questions

Equipment:

- Toy vehicles with various sized wheels
- A selection of surfaces to test the vehicles on such as compost, sand, carpet, wood, plastic
- Masking tape to mark a starting line
- Rulers and metre rules (optional)



Introduction:

Tractors are very useful inventions that can do lots of jobs but why are their wheels so big?

Complete these investigations to explore how big wheels help these helpful machines!

INVESTIGATION 1:



1. Look at the wheels on your vehicles. Which one has the largest wheels? Which has the smallest wheels? You might like to extend this by measuring them with a ruler.
2. Arrange the vehicles in order of wheel size on the starting line.
3. Make a prediction: which vehicle do you think will travel the furthest. Why?
4. Push the vehicles over the starting line and observe which vehicle travels the furthest. You might like to extend this by measuring how far each vehicle has travelled using a metre rule.
5. Repeat this three times. Does the same vehicle always travel the furthest? Why do you think this happens?
6. What does this tell you about how the size of a wheel affects the distance a vehicle can travel?

INVESTIGATION 2:

1. Does the surface that the vehicle is travelling across make a difference?
2. Repeat investigation 1 to explore which size of wheel suits which type of surface. What have you noticed? Which wheel size works best on a smooth surface? Which wheel size works best on a bumpy surface?
3. Using your learning from today's investigations, which wheel size would work best for a tractor?

Links to the National Curriculum for Science:

Working Scientifically:

- Asking simple questions and recognising that they can be answered in different ways
- Observing closely, using simple equipment
- Performing simple tests
- Using their observations and ideas to suggest answers to questions
- Gathering and recording data to help in answering question





Introduction:

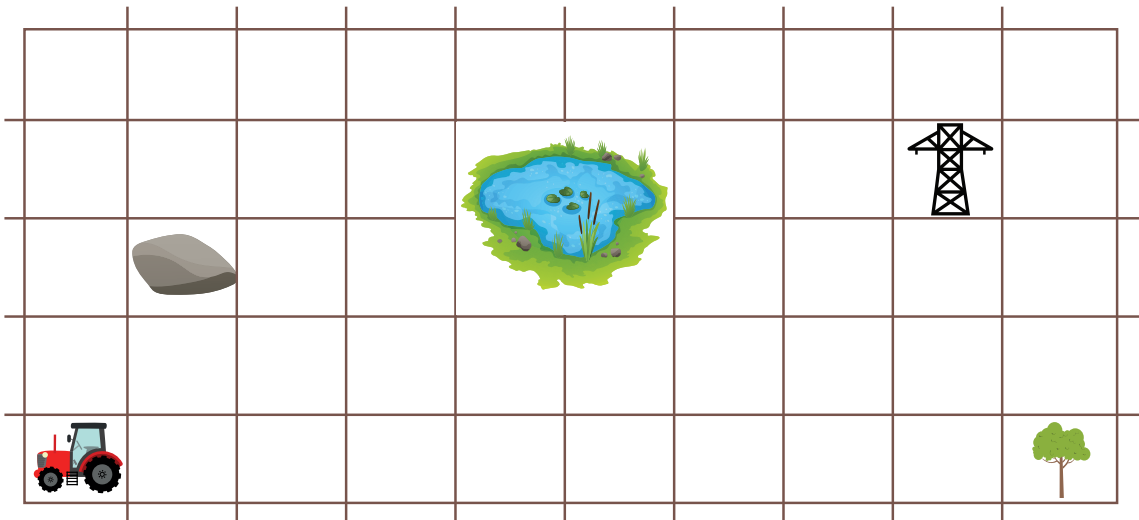
Farmer Eveyy is using her tractor and seed drill to plant some new crops. Her tractor is very clever and can use instructions from satellites in space to help it steer so that plants seeds across the whole field whilst avoiding hitting dangerous obstacles such as electricity pylons and trees.

Your task is to be a space satellite and write an algorithm to give farmer Eveyy's tractor instructions so that it can safely plant seeds in every square on the grid whilst avoiding the obstacles.



Learning Objectives:

- To write a simple algorithm



What to do:

- Think about why farmers want to make sure they plant seeds in all of the available space in their fields?
- Starting from where the tractor picture is, fill in the command grid with a sequence of arrows to plan a safe route across the field, avoiding the obstacles. You can only move one square at a time. Try not to send the tractor into the same square more than once.

Tractor command grid

Extension:

- Draw a field to challenge your partner's tractor navigating skills!



Links to the National Curriculum:

- Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- Use logical reasoning to predict the behaviour of simple programs
- Recognise common uses of information technology beyond school

