



Rugged Robot (IT10000)

The staff and children at Scarcliffe Primary were Terrific Testers and trialled Rugged Robot. Read about how they introduced Rugged into their school and what they learnt.



Here is a picture of the garage that children created for Rugged Robot

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We work in a small, rural primary school in Derbyshire. We have mixed age classes of around 24 children and as a small school, we really struggle for indoor space. We wanted to try Rugged Robot because our children are familiar with the Bee-Bots, and these often form part of our continuous provision in class. The issue we have is that the children have not been able to use the Bee-Bots outside of the classroom and we wanted them to be able to continue learning about coding in the outdoor environment.

Initially, we used the Rugged Robots to supplement the unit we deliver to our FS2 and Year 1 class about using floor turtles, currently using the Bee-Bots. We used both robots alongside each other and the children looked at the similarities and differences between them. They were then very excited to learn that the robots could go outside! We were not surprised to see that the **Rugged Robots became a popular resource** and have seen children naturally using positional language in their conversation – “it needs to go for longer, it has gone too far, you need to go around it.”

The children became keen to explore other areas of the outdoor learning environment while using them too. Some children decided to build a garage for the robot to keep it dry. They were

encouraged to draw designs of the garage in the planning stage, adding labels too. The construction area became a real hive of activity. Upon seeing some children build a garage, others were prompted to design their own shelters for the robot in the garden area. This gave them the chance to harness some of the skills they had been developing in forest schools! We also saw children setting themselves their own challenge to build a small bridge over our water area. Although their designs didn't quite work as they had hoped, they certainly enjoyed the process of trying to build it. We were surprised by the impact the resource has and think that launching it as a whole class through the coding unit did promote the interest and additional learning opportunities.

We also used the TacTile Reader with Rugged Robot to challenge some of the more able children. We could set obstacles for the children to plan to avoid. This helped them to develop teamwork and communication skills as they worked together to predict what would happen and to solve problems when the outcome didn't achieve the desired effect.

What impact have you seen?

The clear impact we have seen has been on engagement and enjoyment.

Our younger children have been so engaged, they have asked if they can have the robots in breakfast and after school club – which of course we allowed them to do. It was great to see the younger children teaching the older pupils how to use them and to see computer coding taking place in clubs is great!

Children have chosen to continue learning and practising their computer coding skills outside of lesson time. This has meant a higher proportion of children could be assessed as having met the learning intentions for those units. The impact was also clear in a variety of areas of the curriculum. The fact that children chose to design and make garages for the robot (without being directed to do so) and this led to a wide variety of learning experiences that we hadn't planned for.

This child-initiated learning resulted in high levels of enthusiasm and engagement as well as meaning the learning was real, purposeful and authentic.

By using the TacTile reader alongside Rugged Robot, teachers have been able to provide higher levels of challenge for children. They have been able to see what children might be doing incorrectly and have listened to them as they have figured out how to 'debug' their own code.

With thanks to the teachers and Headteacher, Ian Marsh, at Scarcliffe Primary School.

The staff and children at Northfield Junior School have been testing and trialling Rugged Robot. Read about how they used Rugged and the impact they are seeing on children's learning.



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We are a school who want all of our children to love coming to school and to find things that excite their curiosity and inspire them to learn, grow and develop as kind, responsible and confident individuals every single day. We are innovative and are not afraid to try new things to encourage children to be deep thinkers or use equipment and resources in their own way to experiment and to try out ideas.

We were keen to own a Rugged Robot because it is so versatile and we can see so many uses across many different areas of the curriculum, both indoors and outside. Outdoor learning and embedding classroom knowledge outside is extremely important to us and we see that these robots can be used in a variety of ways.

We can see the value of using the Rugged Robots within geography to embed compass points, direction and to support ordnance survey map work, within maths to solve problems and to support collaborative learning, degrees, angles and turns, in computing to make algorithms, sequencing and debugging hands on and for free use for the children to experiment. The Rugged Robots also create many opportunities for teamwork, communication, turn taking and creativity – which are all important values for us that support our wider curriculum.

How have you used Rugged Robots?

The Maker Club were the first group of children to use the Rugged Robots. This is a club which supports creativity and innovation and gives the children free rein to experiment and create with a variety of resources.

The first challenge that the children overcame was how to pair the Rugged Robots to the iPads. This was a great exercise in perseverance, resilience and coordinated teamwork. We have created groups of children who are 'experts' whereby they are responsible for charging, putting the robots back in their 'fancy garages' (the sturdy boxes that they came in) and showing other pupils and teachers how they work.

One of the first activities we used the robots for was as a precursor to our scratch project on repeating shapes. They were very good for helping the children to see that the robot had to be programmed specifically to move the appropriate number of times for it to reach where they wanted it to go. This is something that the children usually find difficult when using coding blocks for the first time.

From here the children then set up obstacle courses and set about programming the Rugged Robots to travel through a series of turns, go through obstacles and also to keep it travelling along a bench. Some of the children also worked out how to make the robot climb by using a ramp and to try and make it turn. One child said, "it makes you feel like a policeman looking at a crash!"

The Rugged Robots have supported the children in making connections with technology in the 'real' world such as the police doing crash investigations, road designers, etc. By using the robots, it has given the children something tangible to think of when using coding blocks on the Chromebooks to code and debug a repeating shape.

In Geography, the termly topic was 'Key skills' whereby the children learn the 8 points of a compass and have to find locations on a map. As the Rugged Robot buttons are 45 degrees, this lends itself nicely to practising all of the 8 compass points. If the children programme their robots through a series of compass instructions the robots should end up at a designated point. As a teacher, this is really helpful as you can assess very quickly if the children have used the correct compass points and provide instant feedback via the algorithm on their iPad as to where the error has been made. It is very quick to identify if children are getting East and West mixed up etc.

Once the children were relatively confident with the compass points, we then used them outside in the playground. Using playground chalk, the children drew their own basic map using a range of Ordnance Survey map symbols which they had also learnt. The children then took turns to guide each other to navigate the robots to the various points on their map.

For children who have difficulty in seeing the number of turns either in clock hands or through shape rotation we have used the robots for them to experiment with so they can physically see

the rotations happening. The robots are good for engagement and as they have eyes at the front, they are good for explaining the start and finishing points.

As part of the Maker Club, two girls decided to use the robots to make a Strictly Come Robot Dancing session. They choreographed a sequence for the robots over a few sessions and then at home they developed a dance for them to do themselves. They then put this together with music and worked out how to dance around the Rugged Robots to the beat and tempo of the music.

They are entering this original act into the school's annual talent contest N Factor!

The children have been using the Rugged Robots to enhance their creativity and link using technology with PE, dance and music based on the TV programme Strictly Come Dancing. Using the Rugged Robots in this way has given the girls higher self- esteem and confidence to perform in front of an audience. They had little obstacles to overcome along the way, which promoted team thinking for example about how to set the robots dancing at the same time.

With thanks to the staff and children at Northfield Junior School.

Staff at Corngreaves Academy share their ideas on how to use Rugged Robot.



Designed for indoor and outdoor use
Free programming app available for iOS and Android
Compatible with the TTS TacTile Code Reader

SKILLS & LEARNING

Rugged Robot is great for understanding and developing directional language, developing counting and one-to-one correspondence. Use for Indoor and outdoor activities.

Our ideas

- Construct assault courses, by building ramps and obstacles.
- Direct the Rugged Robot to different features of the outdoor area.
- Create outdoor maps, using natural materials, and move around the map, trying to avoid obstacles.
- Go on a 'Bear Hunt', moving the Rugged Robot over and across different textures and obstacles.

With thanks to our reviewers at Corngreaves Academy.